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Chapter 1 of this report presents an overview of a project to design an innovative, behaviorally oriented undergraduate and inservice teacher education program for elementary school teachers. Chapter 2 presents the conceptual design for developing the model program, one which incorporates the concept of the multiunit school and individual research and instruction units (a team teaching concept). Discussion in this chapter covers the general goals of teacher education and contexts used for their consideration; the plan for development of behavioral objectives; and the way in which educational specifications were generated, managed, and evaluated. Chapter 3 (summarized here but published separately as Vol. 2, SP 001 926) presents the educational specifications as organized by five primary contexts: instructional organization, educational technology, contemporary learning-teaching process, societal factors, and research. Chapter 4 brings the individual educational specifications into comprehensive packages or "models" for six target populations: preservice preschool and kindergarten teachers; preservice elementary teachers, grades 1-8; inservice elementary teachers; teacher educators; school principals and supervisors; and paraprofessionals and teacher aides. Chapter 5 presents the management, evaluation, and feedback systems for implementing the models. Included is a 63-item bibliography. ED 018 677 summarizes the nine models. (Author/JS)

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**FINAL REPORT**
**Project Number: RFP OE-68-4**
**Contract Number: OEC-0-8-089026-3310 (010)**

# Educational Specifications for a Comprehensive Elementary Teacher Education Program

## Volume I
## The Basic Report

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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FINAL REPORT

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# EDUCATIONAL SPECIFICATIONS
# FOR A
# COMPREHENSIVE ELEMENTARY TEACHER EDUCATION PROGRAM

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## VOLUME I

## THE BASIC REPORT

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October 31, 1968

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The research reported herein was performed pursuant to a contract with the Office of Education, United States Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

# PREFACE

The complexity and magnitude of the research project reported in Volume I, *The Basic Report* and Volume II, *The Specifications* have necessitated a professional quest which has gone far beyond the usual research effort. The challenge to design a new, innovative and behaviorally oriented elementary teacher education program which attempts to come to grips with educational change and the process of change was irrestible and consuming. For many persons connected with the project, the unique opportunity represented that "chance in a lifetime" to create a product which could have immediate and direct impact on the various components involved in teacher education. The persons participating in this project have all felt the concern that existing programs of teacher education were not adequate for the changing conditions in American schools. That feeling was translated into a desire and action which, for the first time in history, generated programs arranged in behavioral terms. Eight months is a limited time for what has been produced, and we would have preferred to have had at least six more months for further refinements which could have been made. However, our design as it is implemented can be evaluated at any given point in time and the feedback provided can make it self-correcting. We hope the teacher education profession will provide that implementation.

A large number of persons have made important contributions to this project, and the project staff expresses their heartfelt thanks for each contribution, large or small, which made possible the total result. We wish to recognize these individuals for the acknowledgement they deserve.

The members of the Steering Committee receive a special expression of gratitude for the time they took from their busy lives to react to various project activities. Dr. Klausmeier was the co-author of a position paper and provided general consultant help. Dr. Medley prepared a position paper. Dr. Jones wrote educational specifications in the area of early childhood. Drs. Marklund and Wiseman spent a full week with the project staff. Other members of the committee gave varying amounts of time to us. The names and positions of all members of the Steering Committee are provided below.

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England and Wales

We were fortunate to have obtained a highly qualified group of consultants who gave us considerable and valuable assistance. Dr. Richard Davis of The University of Wisconsin at Milwaukee was associated with the project from its inception and helped formulate its design. Dr. James L. Evans and Mr. Richard L. Yaple led the efforts of the EVCO organization in the formulation of the behavioral objectives. Dr. Nathaniel L. Gage of Stanford University and Dr. Jean D. Grambs of The University of Maryland wrote position papers. Consultants to the project who helped in the revision of behavioral objectives and the generation of educational specifications were:

Dr. David Balzer, The University of Toledo.
Dr. Victor C. Cicirelli, Ohio University.
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Dr. Sidney Eboch, The Ohio State University.
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Mr. James E. Walter, The Wisconsin Research and Development Center for Cognitive Learning
Dr. Robert Wilhoyte, The University of Toledo.

Dr. Daniel Stufflebeam and Dr. Robert Hammond of The Ohio State University are to be especially commended for the excellent work they did in providing the contents of the fifth chapter on evaluation. Without their contribution the project would have lacked an essential ingredient necessary to any plans for implementation.

We are further indebted to Dr. Desmond Cook and Mr. Steven Gyuro of the Ohio State University for their services as PERT consultants. Dr. Fred Pigge of Bowling Green State University deserves our particular thanks for his considerable effort as computer and programmer consultant and expediter.

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# Chapter I

## OVERVIEW AND GENERAL PLAN OF THE REPORT

The contents of Volumes I and II are an effort by a consortium of the State Universities of Ohio to provide, as requested in the RFP (request for proposals) from the Bureau of Research, U.S.O.E., "Educational specifications for a comprehensive undergraduate and in-service teacher education program for elementary teachers."[1] In doing this we have tried to recognize certain viewpoints about schools, teachers, and teacher education that receive excessive comment, limited understanding and negligible action. A representative list of some of these viewpoints follows. They suggest both the need for the project as well as certain obstacles to be overcome.

First, American teacher educators are always ready to talk about educational change, to extol new curricula and methods, and to provide the appearance of positive reaction to educational innovations in the common schools, but when such efforts have run their course, relatively little accomplishment toward teacher education improvement has been visible. Second, most educators are basically conservative by nature and the general evidence from their efforts and the products of their programs indicates lengthy and deep-seated satisfactions with the status quo. Third, the prevailing patterns of teacher education programs in teacher education institutions today are much as they were at the close of World War II with the general course of study providing attention to general education of a broad nature stressing Western cultural concerns, the usual professional courses (child development, methods, curriculum) accompanied by some student field experiences, and possible some opportunity for limited subject matter specialization. The net result is and has been that teacher education programs and personnel are often rather pedestrian, appear incongruous relationship to a modern technological society, and have not done the job expected or hoped for in terms of creatively educating the teachers of our children. And the most unfortunate aspect of the entire situation is that the young teachers subjected to such preparation go into our schools and practice for a lifetime career from their limited and conservative teacher education base with only an occasional dose of in-service education thrown in for what good it may accomplish.

Testimony to the above situation has been voluminous and frequent. Statements have been made by many persons and groups both within and outside the educational establishment. A sprinkling of the flood of comment helps clarify the situation. The Committee for Economic Development in its latest statement on American education has said:

> "The future of the schools depends in large part on whether they can overcome in educational policy and practice what is frequently an extreme conservatism and a strong resistance to change. This depends in turn on whether they can develop a genuine openness to experiment and innovation.

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[1] United States Office of Education, Request for Proposals and Proposal, No. OE-68-4. October 16, 1967. p. 1.

> "We are convinced that reconstruction of instructional staffs, instructional patterns, and school organization must lie at the heart of any meaningful effort to improve the quality of schooling in this country.
>
> "The introduction of team teaching, differentiated teaching functions, and more flexible salary scales offers great opportunity to achieve better results at lower cost. Even more important is the reorganization of staffs and personnel functions so that the new advances in teaching techniques and technology can be utilized effectively. Indeed, considerable money and effort have already been wasted by the premature introduction of such innovations without first creating the conditions for integrating them effectively into school programs.[2]
>
> "The preparation of teachers should be geared to the major developments in educational research and to the improved staffing patterns of the schools. The schools need variety in the talent and function of their teachers rather than sameness and standardization. They need teachers who are capable of grasping the value of new ideas and are able to move in new directions when the evidence warrants."[3]

Kevin A. Ryan of the Graduate School of Education, The University of Chicago has stated:

> "Few people are satisfied with the professional training given to teachers. Complaints come not only from elder statesmen and admirals but also from teacher educators and their students.
>
> "Criticism from within the educational community is perhaps more telling since it comes from the people who have to live with the results. The dissatisfaction seems to center on the relevance of present professional training to the daily work of teachers."[4]

Edgar Dale of Ohio State University has commented:

> "The great revolution going forward today in our schools means a shift in the role of the teacher from a Jack-or Jill-of-all-trades to that of a sophisticated organizer, administrator, and stimulator

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[2] Committee for Economic Development, Innovation in Education: New Directions for the American School. New York: Committee for Economic Development, July 1968. p. 14.

[3] Ibid. p. 51.

[4] Kevin A. Ryan, "A Plan for a New Type of Professional Training for a New Type of Teaching Staff," The Teacher and His Staff-Occasional Papers No. 2. Washington, D. C.: NCTEPS, National Education Association, Feb. 1968. p. 1.

of learning. It means using a mediated instructor where this is efficient and effective. It means a sharp increase in the use of self-administering, self-testing materials of instruction. The new role promises to be more complex and certainly more professional. We have the choice, then, of staying where the inaction is or moving into the excitement and challenge that always faces the pioneer."[5]

Don Davies, Associate Commissioner, Bureau of Educational Personnel Development, U. S. Office of Education, has best summed up the present directions of change in education in a speech delivered to the A.A.C.T.E.'s 14th Biennial School for Executives on August 19, 1968. The quotation is lengthy but is reproduced in its entirety for its clear message and needed emphasis.

> "And now for these directions of change, as I see them right now. The first of these, I think, is that we need to move in education at all levels--pre-school through the university--from a mass approach to teaching and learning to a highly individualized approach to teaching and learning. We still put people in large groups in rooms and tell them things at the same time and expect that they're going to learn a lot from that process. Now if we're going to move from a mass approach to an individualized approach in education it's obvious that the first step has to be a massive job of providing for teachers and administrators and other educational personnel the kind of attitudes and skills and knowledge that they need to perform adequately in an individualized teaching and learning setting. Most of them don't how have those skills, attitudes, and knowledges. We've got to give it to them, or otherwise our talk about individualized instruction is just more nice rhetoric.
>
> "Secondly, I think we must move in education at all levels--pre-school to the graduate school--from an emphasis on memorizing--learning and assembling facts--to an emphasis on learning how to think, learning, how to learn, and an emphasis on the non-cognitive, non-intellectual components of life. Our present system focuses almost entirely, whether we like it or not, on the cognitive side of learning--on storing and getting back facts. Obviously, if we're going to move from a fact-orientated to an idea and non-cognitive feeling and oriented content in education, we're going to have to have a massive program to train and retrain teachers, administrators and other personnel to equip them with the attitudes and the skill and the knowledge they need to function in that new kind of a system. We don't know how now.
>
> "For the third point, we need to move from the concept of the school with a moat around it, carefully protected, to the concept of the school as being an institution that's in and of the community. If we can make that move we can begin to use the total environment of the community as a place for children and for people to learn,

---

[5] Edgar Dale, "New Media: Men and Machines," The News Letter, Volume 33, No. 8, May 1968. p. 4.

rather than just use the isolated environment of the school. Obviously, if we're going to change this concept in American education, it's going to require a massive effort to give the teachers and administrators and other personnel new skills, a new knowledge, new attitudes necessary to function in a new kind of concept of a school and a community. We don't now have those concepts and knowledges and skills--we've got to be trained to them.

"Fourth, we need to move in American education at all levels from our present fear of the machine and technology to harnessing the machine and technology for educational purposes. Now whether we admit it or not the great majority of people in education are really hostile toward and terrified of the new technology. If this concept is going to be changed--if we're going to move toward a constructive utilizing of technology, it will require a massive effort to provide education personnel of all kinds with the new skills and attitudes and knowledges needed to harness the machine for educational purposes.

"Fifth, we need to move in American education at all levels--pre-school to the graduate school--from a negative to a positive attitude toward children who are different. In my opinion, the single most serious block to solving the problem of the so-called disadvantaged child in the rural poverty area or in the ghetto is the fact that by and large our educational system still operates on the concept that these children--these children who are different--really can't learn very much or very well and it really doesn't matter an awful lot whether they do or not. Now to accomplish this kind of change in attitude obviously would require a massive effort to give the teachers, administrators and other educational personnel new attitudes, new skills and new knowledge.

"Sixth, I think we need to move in American education from a white, Western, Anglo-Saxon perspective of the world and the content of education to a multicultured perspective of the world and of such content. It will require giving to personnel in schools and colleges across this country new attitudes, new skills, and new knowledge so that they can do this job we're saying they ought to do. It can only be accomplished by a very intensive and massive educational personnel training effort.

"The seventh move that I think American education needs to make is a move from a system that is still characterized by academic snobbishness to a system that recognizes and nurtures a wide variety of talents and fields. Those of us who are English teachers or teachers of English look down on those poor people down there in the shop who teach all those grubby vocational and technical subjects. We've ignored these fields and students in them far too long. We value more the writing a critical essay than we do reading a blueprint. Now if you're going to change this, what's required? Well obviously a massive effort to give educational personnel, teachers and administrators and others, new concepts, and new skills and new knowledge so that they can operate under these new assumptions.

"Eighth, we need to move from a system which emphasizes meeting requirements and serving time to a system which emphasizes performance. This means of course getting away from emphasis on deciding whether or not a person knows something on the basis of whether or not he spent so many hours in a class or so many days, or so many weeks, or so many years in a course. Writing a test for two hours in some little room some place should not be the final product of education but rather the final test is in how a person lives, feels, thinks, behaves, performs. Now if we're going to move toward a performance based school system and university system it's obvious of course that we're going to need to undertake a massive effort to provide educational personnel of all kinds with new concepts, with new skills, with new knowledge so that they can perform in such a new setting.

"Ninth, we need to move at all levels of education from a climate or environment in the school or college which is bleak and inhibiting to a climate which is free and stimulating. For the educational staff of the school, such a climate means one which includes academic freedom and opportunity for the staff to participate in developing the curriculum and the program of the school, participatory democracy translated to the school level. It means the encouragement to try new ideas, to think; it means a climate which values difference rather than conformity.

"And finally, we need to move in American education, particularly in the school system now, from the concept of the self-contained teacher in the self-contained classroom to the concept of the teacher and his staff. The idea of the teacher being a member of an instructional team, supported, and aided, and working with a variety of other specialists. In order to move, however, it's obvious that you don't simply tell people that they have to start behaving differently, that you have to tell them that they have a new role and they'd better play it. You have to give teachers and administrators help, assistance, and training to develop the new attitudes, the new concepts, the new knowledge that they need to play new roles effectively. It's obvious that we must undertake major, intensive, and more effective ways to educate personnel in schools and colleges--to give them the skills and the concepts and the knowledge that they need to make the changes possible. And it's that latter step--the training and development of staff step--that has been so often neglected in efforts to improve schools."[6]

Obviously, teaching tasks must change and the education of elementary teachers must take cognizance of social change and contemporary developments. The needs of the final third of the twentieth century require elementary teachers whose training is compatible with change. Teacher education has not kept pace with the requirements of preparing teachers for today's elementary schools and this gap between present day requirements and existing teacher education programs has increased rather than decreased. Future preparation of elementary school teachers must reflect current change and development. It is necessary to provide a comprehensive program of teacher education which is relevant to existing and future conditions.

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[6] Don Davies, Address to the AACTE School for Executives, Ashland, Oregon, August 22, 1968.

## The Project and What it Attempts to Accomplish.

This project furnishes a set of detailed educational specifications for the various components of model elementary teacher education programs. The goal is to design a comprehensive plan which insures the generation of specifications for all elements of elementary teacher education. All phases of teacher education from initial input through necessary continuing education programs for teachers are considered.

The model programs and their specifications are not in any sense parochial or limited by any factor in that (1) the present structure of elementary teacher education is not considered a continued concept, and (2) local or national teacher education traditions are not maintained.

The meaning of the above paragraph first refers to the fact that any new challenging teacher education model program should result in corresponding changes and innovations in the elementary school setting where the model is applied and its products placed. The model produced by this project is designed to incorporate the concept of the multiunit school and individual research and instruction (R & I) units (a team teaching concept) developed by the University of Wisconsin Research and Development Center. The usual self-contained classroom and graded elementary school concept or model is abandoned. The R & I unit plan of elementary school organization and operation requires a coordinated design for pre-service and in-service components of a continuing teacher education program. The second meaning of the paragraph--eschewing localism--indicates that the developers of this project have looked beyond themselves and their previous assumptions about the education of elementary teachers to the possibilities available in teacher education program objectives, patterns, and products in other situations, near and far. For example, the Project Steering Committee contains representatives from England and Sweden due to the interesting state of development of early childhood education in England and the extensive national study of teacher education which has taken place in Sweden. Further, reported new solutions to teacher education and elementary education have been examined wherever found with the thought that no physical, geographical, or educational limits should be placed on realistic efforts to produce meaningful comprehensive specifications.

This project has developed model programs containing specifications which will enable teachers to be prepared for elementary schools in general, as well as selected subsets of the educational population. The attempt has been made to make a continuing contribution to all aspects of the educational population concerned with elementary education. Specifications have been generated for six basic populations concerned with elementary teaching. The initial two populations include those who are prepared through undergraduate programs for elementary teaching, who enter the teaching profession upon the attainment of the baccalaureate degree, and who must experience continuing education to support their introduction to teaching and insure continued growth in-service. In this teacher category, specifications have been prepared for pre-school--kindergarten teachers and elementary teachers (grades 1-8). The third population includes those individuals currently teaching who need additional education to improve their personal competence and to be able to cooperate, adequately, with teachers from the first group. These persons are usually referred to as "teachers in-service." To insure the success of these teacher populations, specifications are provided for three further populations: college--university personnel who will be involved in instructing teachers and administrative and supportive personnel who will be co-workers with all previously mentioned personnel groups. Administrative personnel refers to elementary school principals and supervisors. Supportive personnel in this context includes para-professionals and teacher aides. The target populations in summary form are as follows:

1. Pre-service--Pre-school and Kindergarten Teachers.
2. Pre-service--Elementary Teachers (Grades 1-8).
3. In-service Teachers (All levels).
4. College and University Personnel (the teachers of teachers).
5. Administrative Personnel (principals and supervisors in Elementary Schools).
6. Supportive Personnel (Para-professionals--Teacher Aides).

The final composite models requested in the U.S.O.E. RFP consist of comprehensive teacher education specifications for each of the six target populations. These comprehensive specifications are defined in behavioral and operational terms so that they can be considered, adapted and implemented by institutions preparing elementary teachers. Prescription is supplied but the comprehensive models are structured in such a way that flexibility is provided for innovation by any implementing institution. The models permit a broad application of the specifications to a total elementary education system. This concept has required that all elements of the system have been given appropriate and adequate treatment to the degree possible in the time available for this project. This strategy insures that new and retrained teachers will receive intelligent and sympathetic support, minimizing future risks of teacher failure and educational unresponsiveness to change.

## General Plan of the Report.

The remaining pages of the report have been divided into five sections or chapters. Chapter II deals with the conceptual design for developing the model programs. Discussion in this chapter covers the general goals of teacher education, the primary contexts used for consideration of the teacher education goals, the plan for development of behavioral objectives, the way in which educational specifications were generated, and a brief consideration of the management and evaluation of the specifications. Chapter III presents the educational specifications as organized by five primary contexts. Chapter IV brings the individual educational specifications into comprehensive packages or "models" for six target populations: pre-service pre-school and kindergarten teachers, pre-service elementary teachers for grades 1-8, in-service elementary teachers at all levels, college and university personnel who are involved in educating teachers, administrative personnel including principals and supervisors, and supportive personnel who are para-professional, teacher aide types. Chapter V provides the management, evaluation, and feedback systems for implementing the comprehensive, composite packages of specifications or models. The final chapter, VI, summarizes the entire report. Chapters I, II, IV, V and VI appear in this Volume I. A brief summary of Chapter III also appears in Volume I. However, all of Chapter III, including every educational specification, will be found in Volume II.

# Chapter II

# THE CONCEPTUAL DESIGN FOR DEVELOPING THE MODEL PROGRAM

The University of Toledo and the eleven other state universities in Ohio have formed a Consortium to design a program of elementary teacher education which is relevant to social and educational change and which includes provisions for continuous evaluation and revision. The University of Toledo has assumed the role of initiator, compiler and coordinator of the effort with Dean George E. Dickson serving as Project Director and Coordinator. The project staff was recruited from The University of Toledo, Ohio State University and Ohio University. Personnel were drawn from other state universities in Ohio in consultant capacities. An international steering committee of recognized authorities in various fields was formed with members selected according to the needs suggested by an application of Tyler's rationale for developing a curriculum.[7] Consultants to the project came from a wide variety of positions and places. A working, cooperative relationship was established with the Wisconsin Research and Development Center for Cognitive Learning and the Michigan and Ohio Regional Educational Laboratory. The services of EVCO, a private educational consulting firm, were utilized. All persons connected with the project have been recognized in the acknowledgements.

The overall strategy of developing the project can best be comprehended by an examination of Figure 1, a schematic representation of a time schedule for three stages of the project. The first stage consisted of the efforts necessary to plan the project proposal requested by the U.S.O.E. which resulted in the submission of the proposal on January 1, 1968. The second stage--after proposal acceptance by the U.S.O.E.--was the activity necessary to design the model program(s). This activity began March 1, 1968 and ended October 31, 1968. The third stage will be the implementation of the model program(s) produced. This implementation cannot begin until the Ohio Consortium or some other interested institutions develop implementation plans, secure funding, and then function at this final level of project development.

The process of arriving at the composite-comprehensive educational specifications for a model elementary teacher education program can now be delineated. The several factors which were considered in this process are presented in Figure 2 which not only provides a "flow" of necessary factors involved but also indicates the outcomes at various points in the procedures for developing specifications, with each outcome depending upon the preceding step.

Summarizing graphically, the conceptual design of the project is clearly represented in Figure 2. Figure 3 indicates the personnel having primary responsibility for the various steps in developing the specifications. Figure 4 provides the relationship of the personnel to the conceptual design. Figure 5 displays the organization structure of the Ohio Consortium for project design and participation plus the eventual implementation of the

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[7] See, Ralph W. Tyler, Basic Principles of Curriculum and Instruction, Chicago: University of Chicago Press, 1950.

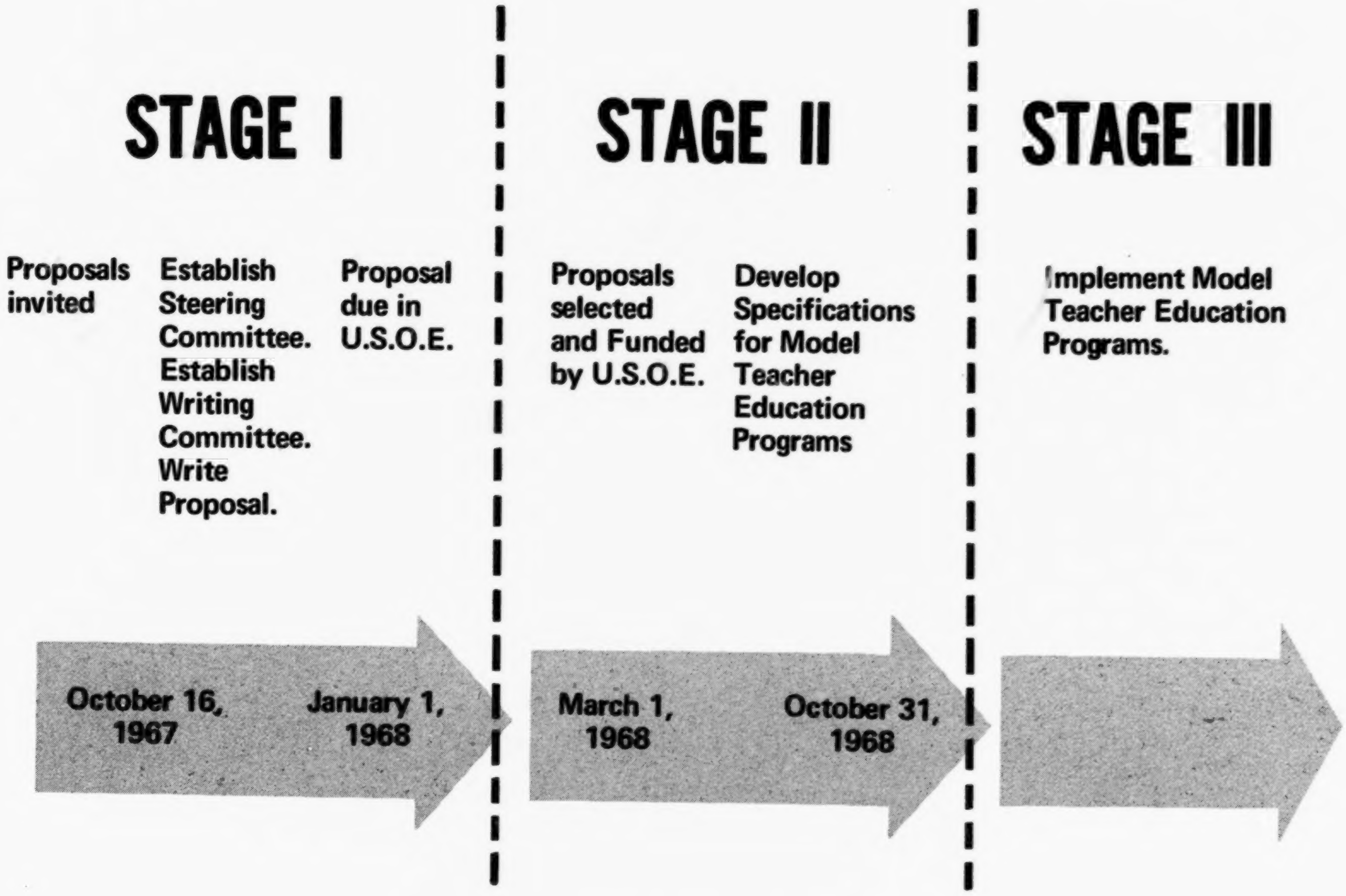
STAGE I
STAGE II
STAGE III
Proposals invited
Establish Steering Committee. Establish Writing Committee. Write Proposal.
Proposal due in U.S.O.E.
Proposals selected and Funded by U.S.O.E.
Develop Specifications for Model Teacher Education Programs
Implement Model Teacher Education Programs.
October 16, 1967
January 1, 1968
March 1, 1968
October 31, 1968

Figure 1. Schematic Representation of Project Stages.

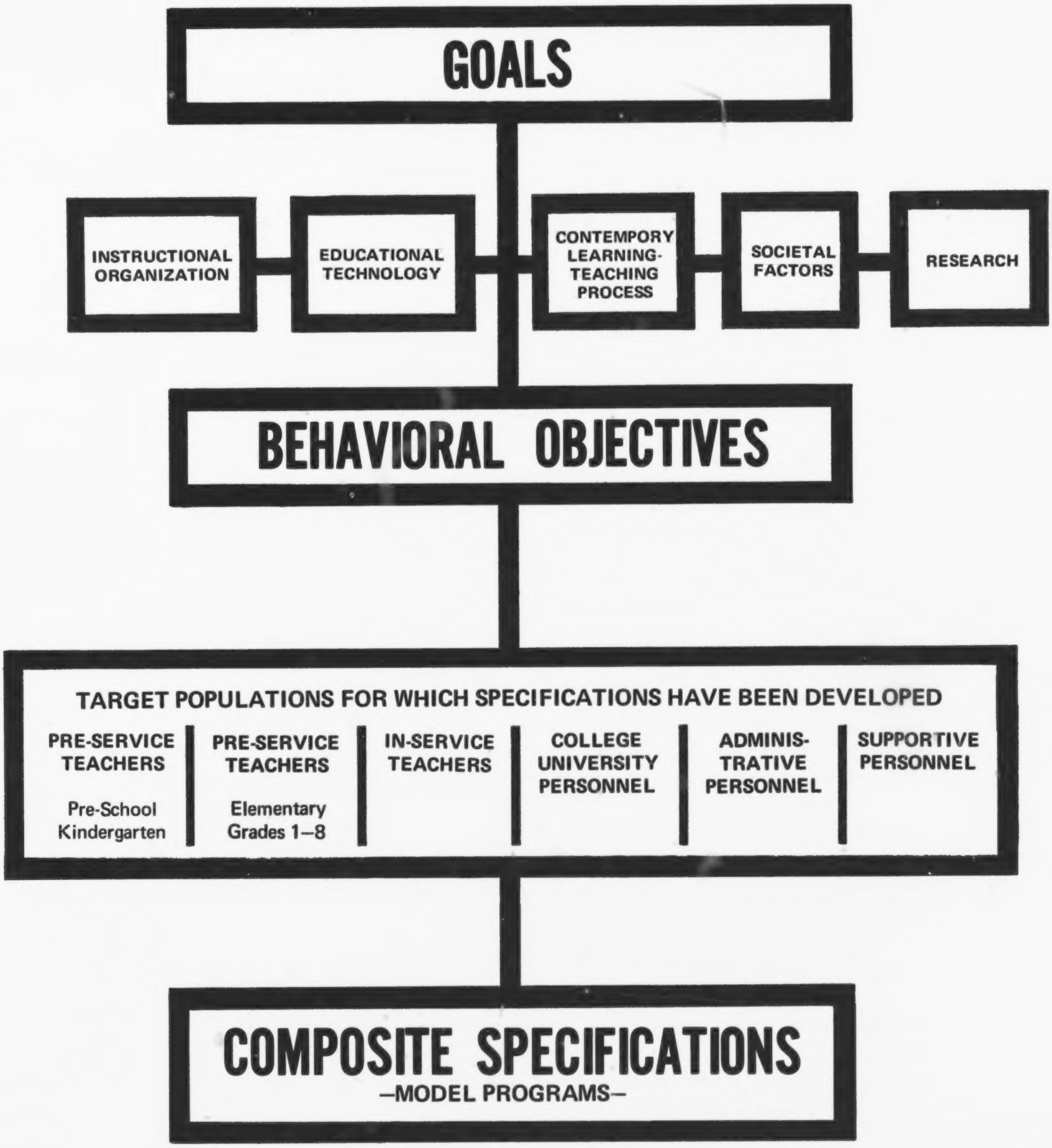
GOALS
INSTRUCTIONAL ORGANIZATION
EDUCATIONAL TECHNOLOGY
CONTEMPORY LEARNING-TEACHING PROCESS
SOCIETAL FACTORS
RESEARCH
BEHAVIORAL OBJECTIVES
TARGET POPULATIONS FOR WHICH SPECIFICATIONS HAVE BEEN DEVELOPED
PRE-SERVICE TEACHERS
Pre-School Kindergarten
PRE-SERVICE TEACHERS
Elementary Grades 1–8
IN-SERVICE TEACHERS
COLLEGE UNIVERSITY PERSONNEL
ADMINIS-TRATIVE PERSONNEL
SUPPORTIVE PERSONNEL
COMPOSITE SPECIFICATIONS
–MODEL PROGRAMS–

Figure 2. A conceptual design for developing specifications

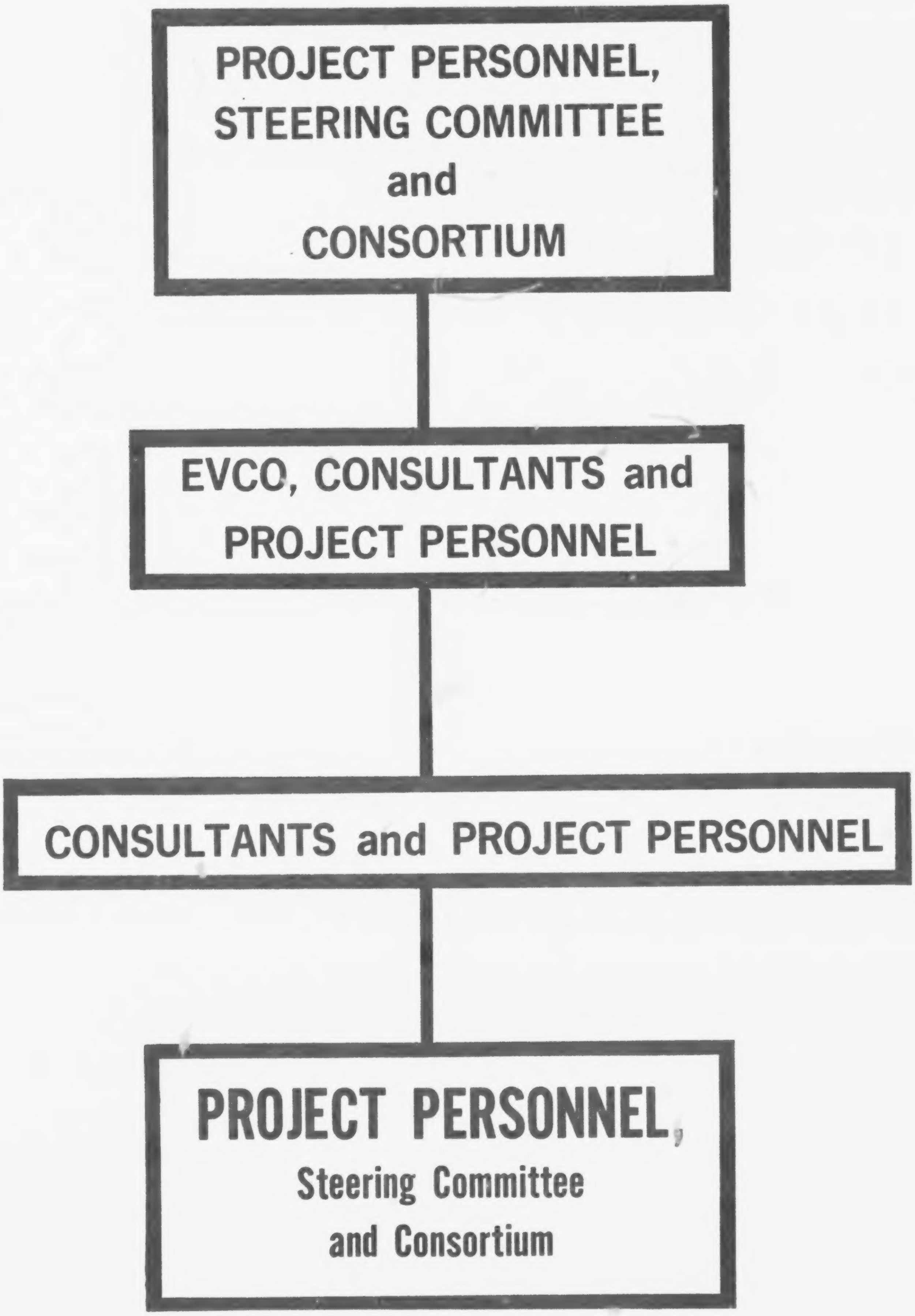
PROJECT PERSONNEL, STEERING COMMITTEE and CONSORTIUM
EVCO, CONSULTANTS and PROJECT PERSONNEL
CONSULTANTS and PROJECT PERSONNEL
PROJECT PERSONNEL, Steering Committee and Consortium

Figure 3. Personnel having primary responsibility for the steps in developing specifications.

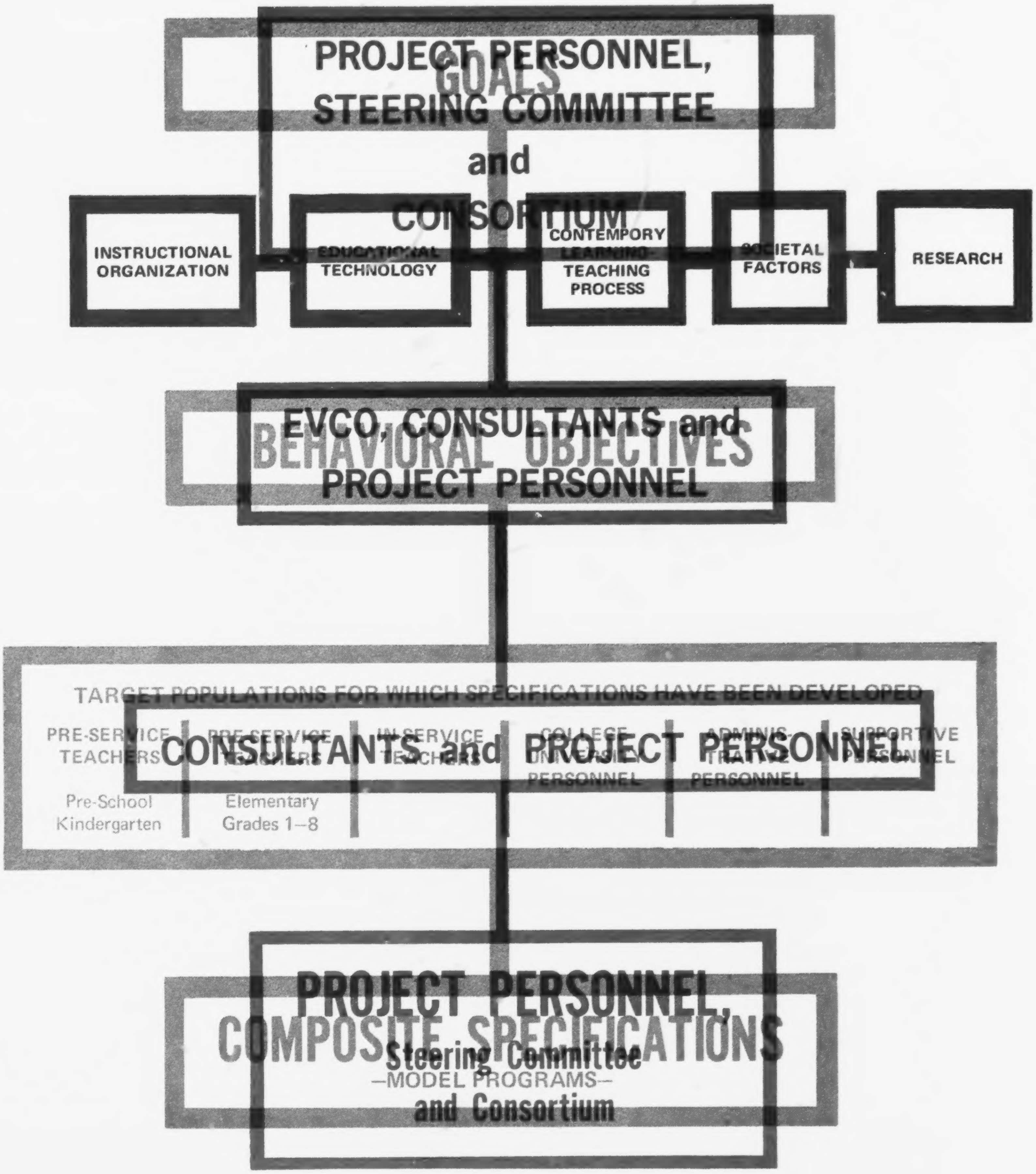
PROJECT PERSONNEL,
STEERING COMMITTEE
and
CONSORTIUM
GOALS
INSTRUCTIONAL ORGANIZATION
EDUCATIONAL TECHNOLOGY
CONTEMPORY LEARNING-TEACHING PROCESS
SOCIETAL FACTORS
RESEARCH
EVCO, CONSULTANTS and
PROJECT PERSONNEL
BEHAVIORAL OBJECTIVES
TARGET POPULATIONS FOR WHICH SPECIFICATIONS HAVE BEEN DEVELOPED
PRE-SERVICE TEACHERS
Pre-School Kindergarten
PRE-SERVICE TEACHERS
Elementary Grades 1–8
IN-SERVICE TEACHERS
COLLEGE UNIVERSITY PERSONNEL
ADMINISTRATIVE PERSONNEL
SUPPORTIVE PERSONNEL
CONSULTANTS and PROJECT PERSONNEL
PROJECT PERSONNEL,
Steering Committee
and Consortium
COMPOSITE SPECIFICATIONS
—MODEL PROGRAMS—

**Figure 4. The relationship of the personnel to the conceptual design.**

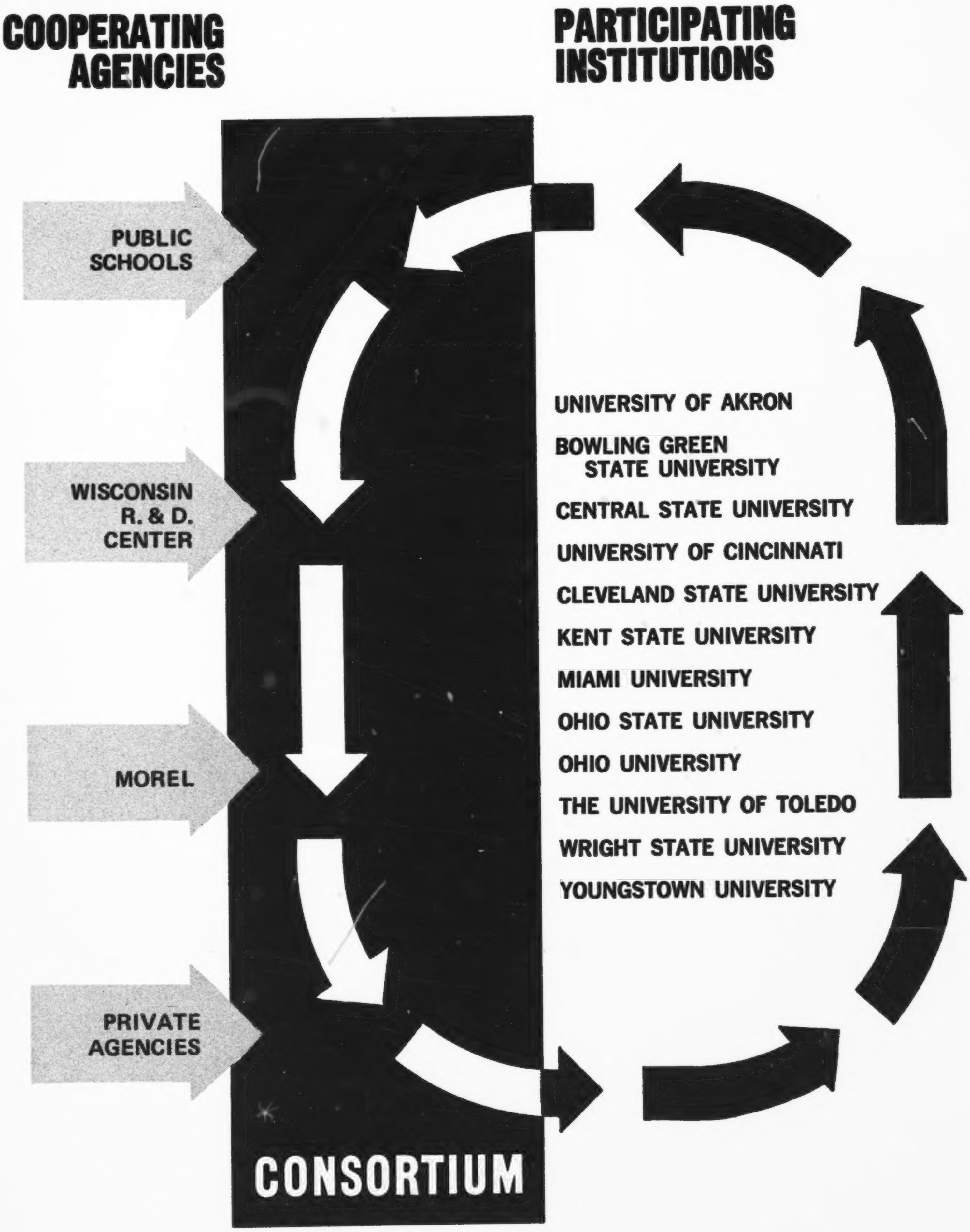
COOPERATING AGENCIES
PARTICIPATING INSTITUTIONS
PUBLIC SCHOOLS
WISCONSIN R. & D. CENTER
MOREL
PRIVATE AGENCIES
CONSORTIUM
UNIVERSITY OF AKRON
BOWLING GREEN STATE UNIVERSITY
CENTRAL STATE UNIVERSITY
UNIVERSITY OF CINCINNATI
CLEVELAND STATE UNIVERSITY
KENT STATE UNIVERSITY
MIAMI UNIVERSITY
OHIO STATE UNIVERSITY
OHIO UNIVERSITY
THE UNIVERSITY OF TOLEDO
WRIGHT STATE UNIVERSITY
YOUNGSTOWN UNIVERSITY

Figure 5. Project organization for development implementation of new teacher education program(s).

teacher education programs determined by the specifications. The remainder of this chapter considers each of the factors identified in the conceptual design (Figure 2).

Goals.

There have been many attempts to establish educational goals and these have reflected social and psychological concepts dominant at the time they were written. Some of the more important of these goal lists were the Seven Cardinal Principles,[8] the Educational Policies Commission Classification,[9] and the Mid-Century Committee Statement on Outcomes in Elementary Education.[10] These statements of goals have a certain appropriateness and could possibly have been chosen as the goals for this project. However, we also sought to discover what goals of elementary teacher education might be obtained from a survey of pre-service and in-service objectives of teacher education as compiled from university catalogues and reports of in-service activities. A random sample of catalogues from forty-four large universities and twelve reports of in-service education were used. The findings were disappointing in that the objectives from both sources clustered around general statements indicating concern for professional education, broad liberal studies, educational leadership, and psychological factors (learning process, knowledge of learner, etc.) which, while broadly relevant, did not clearly indicate any considerable degree of thought and refinement in terms of comprehensive goals for teacher education. These goals and previous lists were definitely not appropriate for a program which envisions an evaluation of goals in behavioral terms.

The project staff then searched the literature for appropriate statements of goals for teacher education and finally adopted a list which was developed by the Committee on Quality Education, State Department of Education, Harrisburg, Pennsylvania.[11] We recognize there are more ideal ways to attain goals for American teacher education. One could make a careful study of society, the learners, and recommendations of content specialists. The goals produced from such efforts could then be screened through a framework to be sure that they were in conformity with the humanitarian emphases of democracy and also to be sure that their attainment was a reasonable learning task according to the latest information about child growth and development. This appealing procedure was denied to us by constraints of time, finance, and limited personnel.

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[8] Developed in 1918 by the Commission on Reorganization of Secondary Education of the National Education Association.

[9] Developed in 1938 by the Educational Policies Commission of the National Education Association.

[10] Nolan C. Kearney, Elementary School Objectives. New York: Russell Sage Foundation, 1953.

[11] The Committee on Quality Education was made up of members of the Pennsylvania State Board of Education who contracted the project to the Educational Testing Service. Experts in the behavioral sciences from all over the country constituted a Standing Advisory Committee for the project. A three volume report entitled A Plan For Evaluating the Quality of Education Programs in Pennsylvania, Educational Testing Service, Princeton, New Jersey, 1965, describes the development of the goals, the goals, and how the goals were evaluated.

The goals which were selected from the aforementioned source on an *a priori* basis were then submitted to members of the Steering Committee and representatives of the Consortium formed for this project for goal legitimation or alteration. In this regard it should be noted that the Steering Committee and the Consortium representatives represent by expert authority a range of elements essential to a careful effort to formulate goals. It should also be emphasized that the goals selected were initially formulated by a careful process aided by expert advisors. The goal review and legitimation effort consisted of presenting the statement of goals and their rationale in a questionnaire form to each respondent. This instrument provided an opportunity to indicate the degree of importance of each goal and any necessity to modify or expand upon it. The results of this effort are contained in Table 1 which indicates the very positive reactions of the respondents to the goals and the relevance of these goals as a basis for further project efforts. Fourteen out of twenty-four respondents chose to comment further about the goals presented to them but these comments were for the most part laudatory and did not urge any serious alterations or modifications.

Thus we arrived at the following broadly defined statement of goals for teacher education[12] which (1) reflects the problems which society faces in the world of today and tomorrow and (2) suggests definite kinds of teacher performances which can be observed and measured in behavioral terms to determine the teacher's progress toward each goal.

I. Each teacher should be prepared to employ teacher behaviors which will help every child acquire the greatest possible understanding of himself and an appreciation of his worthiness as a member of society.

> "Self-understanding should increase as the child matures. That is, he should become increasingly aware of his strengths and weaknesses, his values and interests, and aspirations, so that the decisions he makes about his educational occupational future will be informed, reasonable, and rational. He should be helped to know the strengths in himself that he should exploit and the weaknesses that he should try to overcome or that he must learn to live with.

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[12] The statement of goals appearing in this report has been altered slightly from the original for our purposes but the rationale for each goal statement is quoted verbatim. The original source is found in the previous footnote reference (No. 11) and also in *Highlights*, A Report from the Educational Testing Service to the State Board of Education of the Commonwealth of Pennsylvania. Princeton, N. J.: Educational Testing Service, June 30, 1965, pp. 10-13. Our thanks is also expressed to Mr. Severino Stefanon, Secretary, State Board of Education, Harrisburg, Pennsylvania for making possible the complete examination and use of both aforementioned sources.

## TABLE I

## RESPONDENT REACTIONS TO TEACHER EDUCATION GOALS[a]

| Response | Great Importance | | Moderate Importance | | Little Importance | | No Importance | |
|---|---|---|---|---|---|---|---|---|
| Goal | No. | % | No. | % | No. | % | No. | % |
| 1 | 18 | 90 | 2 | 10 | 0 | 0 | 0 | 0 |
| 2 | 16 | 80 | 4 | 20 | 0 | 0 | 0 | 0 |
| 3 | 16 | 80 | 4 | 20 | 0 | 0 | 0 | 0 |
| 4 | 16 | 80 | 4 | 20 | 0 | 0 | 0 | 0 |
| 5 | 17 | 85 | 3 | 15 | 0 | 0 | 0 | 0 |
| 6 | 12 | 60 | 6 | 30 | 2 | 10 | 0 | 0 |
| 7 | 12 | 60 | 6 | 30 | 1 | 5 | 1 | 5 |
| 8 | 15 | 75 | 4 | 20 | 1 | 5 | 0 | 0 |
| 9 | 15 | 75 | 4 | 20 | 1 | 5 | 0 | 0 |
| 10 | 16 | 80 | 2 | 10 | 2 | 10 | 0 | 0 |

[a] The number of respondents was 24. The total number of responses in each of the rows is 20 rather than 24 because four subjects did not respond to each of the goals individually but stated that all ten goals were acceptable.

> "On the other hand, regardless of the level and pattern of his particular talents, the school experience should be such that it will strengthen, not damage, his self-esteem. The school should be operated in such a way that children at all levels of talent can achieve a growing awareness of their worth as persons in a society that claims to have an equality of concern for all its members."

II. Each teacher should be prepared to employ teacher behaviors which will help every child acquire understanding and appreciation of persons belonging to social, cultural, and ethnic groups different from his own.

> "The school experience should be such that the child will learn to respect and achieve an easy interaction with children who differ from him in physical characteristics (e.g., skin color), of speech, and degree of intellectual competence."

III. Each teacher should be prepared to employ teacher behaviors which will help every child acquire to the fullest extent possible for him mastery of the basic skills in the use of words and numbers.

> "These basic skills fall into four broad categories: (1) the ability to acquire ideas through reading and listening, (2) the ability to communicate ideas through writing and

speaking, (3) the ability to handle mathematical operations, (4) the ability to reason logically and to respect evidence. The level of performance that can be reasonably expected in each of these areas will vary from child to child. However, since a civilized society depends crucially upon the verbal and mathematical literacy of its members, it is of profound importance that the level of expectation in these matters for any child shall not be underestimated or regarded as fixed and that every effort be made to give him the mastery he needs to function effectively."

IV. Each teacher should be prepared to employ teacher behaviors which will help every child acquire a positive attitude toward school and toward the learning process.

> "The school experience should be such that the child finds the learning activities associated with it enjoyable and rewarding to the point that he is motivated to do well and to continue learning on his own initiative beyond the requirements of formal education. Everything possible should be done to ensure that the attitude of the teacher, the atmosphere of the school, and its physical condition shall contribute toward this end, so that the individual, both as a child and later as an adult, will hold education high among his values."

V. Each teacher should be prepared to employ teacher behaviors which will help every child acquire the habits and attitudes associated with responsible citizenship.

> "Of first importance among such habits and attitudes are (1) loyalty to the fundamental principles of a free democratic society as expressed through a readiness to defend its institutions, to bring rational criticism to bear on their defects, and to work for changes leading to their improvement, (2) effective participation in group activities by assuming the role of a leader or a follower as appropriate, (3) appreciation and acceptance of the necessity for earning a living, (4) acceptance of the basic ethical values that make group living possible--values characterized by such terms as honesty, fair dealing, and compassion for the less fortunate."

VI. Each teacher should be prepared to employ teacher behaviors which will help every child acquire good health habits and an understanding of the conditions necessary for the maintenance of physical and emotional well-being.

> "In his own interest as well as in the interest of society at large, a child should know how to take care of himself and how to keep himself physically fit. He should know what the requirements are for physical and mental health and what practices, harmful to health, should be avoided. Mere knowledge of these matters, however, is not sufficient. In cases where the home has been deficient in encouraging the child to practice sound health habits, the school has an obligation to be aware of the situation and to see that opportunity for remedying the deficiency is provided."

VII. Each teacher should be prepared to employ teacher behaviors which will help every child acquire opportunity and encouragement to be creative in one or more fields of endeavor.

> "The notion of creativity has been variously defined. It is being used here to encompass worthwhile activities that a child initiates and pursues on his own--activities having an outcome that is perceived by the child himself and by others as a contribution to some part of his world. Such activities can be included in a wide variety of fields, not only the sciences and the arts but also the organization of human affairs and the development and exercise of salable skills in the production of any of a host of practical things that enrich our way of living."

VIII. Each teacher should be prepared to employ teacher behaviors which will help every child understand the opportunities open to him for preparing himself for a productive life and should enable him to take full advantage of these opportunities.

> "This goal implies that most children can profit from some form of education beyond high school, whether it be at a four-year college, a school of nursing, a community college, a technical institute, or the like. The youngster should be aware of these opportunities and seek out the particular kind of education best suited to his talents and interests. This goal also implies that the school will provide the child with the kind of guidance that will enable him to do so.
>
> "Furthermore, the school should help him discover the practically unlimited possibilities for continuing self-development both in the world of work and in the world of the mind so that he will be motivated to pursue excellence in all the forms of human endeavor that are appropriate for him."

IX. Each teacher should be prepared to employ teacher behaviors which will help every child understand and appreciate as much as he can of human achievement in the natural sciences, the social sciences, the humanities, and the arts.

> "Insofar as possible, every child should gain from his school experience an increasing openness to the life of the mind and an increasing ability to find meaning for his own life in the heritage of the past and in the intellectual thrusts of the present age. He should achieve some understanding of the transforming conceptions of modern science. He should achieve increasing mastery over the basic principles of social and psychological sciences. He should develop a degree of sensitivity that enables him to differentiate the worthy from the worthless in the multifarious products of civilization as we know it--books, motion pictures, radio, television, music, and the visual and performing arts, architecture, industrial design, and the like."

X. Each teacher should be prepared to employ teacher behaviors which help every child to prepare for a world of rapid change and unforeseeable demands in which continuing education throughout his adult life should be a normal expectation.

> "The explosion in knowledge, the impact of science on the economy, the almost unpredictable nature of the job market for both the short term and the long term, the increase in opportunity for leisure-time activities--all these developments make it apparent that education, if it is to fulfill the life-long needs of the individual and the future needs of society, cannot stop at grade 12 or grade 14 or grade 16. Such continuing education may take many forms: it may be self-education, it may be formally organized retraining, it may be adult classes of a recreational nature. Whatever the form, it must be regarded as an essential of an individual's activity through his adult life if he is to keep up to date as a worker, as a citizen, and as a person."

## Primary Contexts.

The goals which have been identified are quite general and any number of factors might be brought to bear in generating behavioral objectives which will allow a more critical observation and measurement of the many parts and aspects of the broad goals of teacher education. In order to provide factors or contexts for the transforming of general goals into more specific behavioral objectives, five primary contexts have been identified. These comprise the components of the second line of the diagram in Figure 2 on page 11. These components should not be thought of as the only factors impinging or limiting the movement from goals to behavioral objectives. However, they appear of prime importance and they are in many ways interrelated and overlapping.

The importance of these contexts--instructional organization, educational technology, contemporary learning-teaching process, societal factors, research--was such that their further consideration demanded considerable effort to delineate the concerns, forces, and factors involved in each topic. Accordingly, a plan was devised to ask a highly-qualified, recognized authority in each context field to prepare a position paper on the topic. In addition, other well-qualified persons were asked to read the position papers produced and to react to them. These position papers and reactions became a major input for the development of behavioral objectives.

Position papers were prepared by the following persons:

Position paper on Instructional Organization
Dr. Herbert J. Klausmeier, Professor of Educational Psychology and Director, Wisconsin Research and Development Center for Cognitive Learning, University of Wisconsin.

Position paper on Educational Technology
Dr. Gregory Trzebiatowski, Associate Professor of Education, The Ohio State University.

Position paper on Contemporary Teaching-Learning Process
Dr. Nathaniel L. Gage, Professor of Education and Psychology and Co-Director, Stanford Center for Research in Teaching, Stanford University.

Position Paper on Societal Factors
Dr. Jean D. Grambs, Professor of Education, University of Maryland.

Position Paper on Research
Dr. Donald Medley, Head, Teacher Behavior Research Group, Educational Testing Service

Reactions were supplied by the following persons:

Reaction on Instructional Organization
Dr. William Wiersma, Jr., Professor of Education and Director, Center for Educational Research and Services, The University of Toledo.

Reaction on Educational Technology
Dr. Robert Marker, Vice President, Management Information Services, Westinghouse Learning Corporation.
Dr. Alexander Schure, President, New York Institute of Technology.

Reaction on Contemporary Learning-Teaching Process
Dr. William L. Franzen, Professor of Education, The University of Toledo.
Dr. Lloyd Homme, Behavioral Technology Department, Westinghouse Research Laboratory, Albuquerque.

Reaction on Societal Factors
Dr. Edward J. Nussel, Professor of Education, The University of Toledo.

Reaction on Research
Dr. Frederick R. Cyphert, Dean, College of Education, The University of Virginia.

Reactions were provided orally and in writing. The position papers on Instructional Organization and Educational Technology contain the reactions of the expert readers. This was not true in the other three position papers produced. In these instances formal reaction papers were written. All reactors also had direct, consultative contacts with the project staff and/or EVCO, the principal producer of the behavioral objectives. The papers supplied by reactors are not reproduced in this report.

The position papers are reproduced in full on the following pages. A brief statement about the context being discussed will precede each paper. The contents and positions of the various papers are those of the authors and no attempt has been made by the project staff to request or influence a particular result. In turn, those persons directly affiliated with the project have not felt constrained by positions taken by the writers of the papers. It was hoped that the position and reaction papers would provide needed information as input for the production of behavioral objectives. This purpose, we believe, was achieved.

The Context of Instructional Organization. The instructional organization of the elementary school has undergone several attempts to convert from the self-contained classroom to some organization that is economically and educationally more effective. In order to give greater attention to individualized instruction and capitalize on a more efficient use of teachers, various instructional organizations falling within the rubrics of team teaching have been attempted and implemented. However, operational definitions of team teaching situations vary markedly all the way from some kind of cooperative planning between two teachers to relatively elaborate structures involving several teachers with various specific duties. With new developments in elementary education it has become increasingly apparent that it is not efficient in terms of the teacher's personal planning and development to require that he be in charge of a self-contained classroom during the entire school day. Teachers require time for cooperative planning, instructional development and study during their work day if teaching is to be recognized as a bonafide, dynamic profession.

An instructional organization that has many of the features of team teaching, along with considerable background research and development, is the multiunit school and the concept of research and instruction (R & I) units. The R & I units were developed and tested through efforts of personnel at the Research and Development Center for Cognitive Learning at the University of Wisconsin. A multiunit school is an unique organization of teachers, principal and other personnel within a school building. Teachers, student teachers and aides of an R & I unit are organized on a team teaching basis, with each individual having roles and responsibilities in the operation of the unit.

A primary objective of an R & I unit is to develop an exemplary instructional program. The organization of the R & I unit provides for the continuous improvement of this program through research, development, and innovation. A second important objective of the R & I unit is to provide an environment which is conducive to research and development activities of teachers in the unit as well as personnel from the central staff of the system, the administrative staff of the building, and individuals from universities or other educational agencies. The broad and varied utilization of staff in the R & I unit along with the flexibility of instructional procedures provides the basis for an individualized program of instruction.

It is not enough to inspect the instructional demands of the elementary school and conclude that the self-contained classroom is inefficient and outmoded in the context of today's society. Teacher education programs cannot be developed in a void of instructional organization, for the type of instructional organization to be used has marked implications for the preparation of future teachers. Therefore, of necessity, we have decided the type of instructional organization we are going to employ at the outset of this project. The concept of the multiunit school and the employment of R & I units within it has not only been developed on an a priori basis, but has been shown empirically to be an effective and efficient way of providing the instruction necessary in today's elementary schools.[13] For this reason, the R & I units type of instructional organization has been selected as the organizational base on which the planning of behavioral objectives and educational specifications for our model teacher education program has proceeded.

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[13] Research evidence has been compiled indicating the effectiveness of R & I Units organization in terms of instruction, research, and innovation. See: Herbert J. Klausmeier and Mary R. Quilling, "An Alternative to Self-Contained, Age-Graded Classes," (Mimeographed research report on research done pursuant to a contract with U.S.O.E., Cooperative Research Program Center, No. C-03/Contract OE 5-10-154) 15 pp.

## Position Paper for the Context of Instructional Organization

# THE MULTIUNIT ORGANIZATION (R & I UNITS) AND ELEMENTARY EDUCATION IN THE DECADES AHEAD

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The major purpose of this paper is to describe a new kind of organization for instruction, and a related environment, in the elementary school. Sufficient experience has been gained with this organization since 1966 in Wisconsin and Ohio schools to indicate its relevance to elementary education at present and also to estimate its utility in facilitating various functions of the elementary school of the future. A brief appraisal of the current status of elementary education and some estimates of future trends provide the context in which to view the Multiunit School organization.

## I. The Elementary School of Today and in the Future

Most elementary schools of today are performing limited functions in comparison with what they will perform in the future. A few schools throughout the nation, however, are the forerunners of the many schools of tomorrow. Many functions of future schools may be observed at present in eight elementary schools of Janesville, Madison, Manitowoc, and Racine, Wisconsin. These schools began operating in the Multiunit pattern in 1967-1968. A statewide model for starting other Multiunit Schools, with all funding by the local schools, was planned during 1968 by the Wisconsin R & D Center for Cognitive Learning, the Wisconsin Department of Public Instruction, selected teacher-education institutions, and local school systems.

The main function of the staff of an elementary school building today is maintaining an instructional program that is as good as in the past.[1] The primary function of each elementary school in the future is developing and executing an improved program of individually guided education. In order to carry out this function well, there must be a continuous supply of beginning teachers and other instructional personnel. These beginners must develop many capabilities while on the job; they cannot be prepared to deal with all the situational variables related to children and other elements of a school's instructional program prior to working in the school. Also, new ideas, materials, and procedures will require testing in the school setting before being accepted and used. Further, since knowledge about human learning and instruction is incomplete, some schools will also participate with other agencies, such as universities, in research and development activities.

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[1] Hereafter we refer to the elementary school of today to designate schools that have not incorporated such practices as team-teaching, preservice teacher education, in-service education, or systematic instructional improvement.

We may summarize thus:

| Functions of the Elementary School Today | Functions of the Elementary School in the Decades Ahead |
|---|---|
| (1) Attempting to execute a system-wide standard instructional program designed by others | (1) Developing and executing an effective system of individually guided education within each building |
| (2) Accepting sporadic attempts by other agencies to update the teaching staff | (2) Initiating and performing in-service education of teachers and other instructional personnel within each building as part of a systematic system-wide and statewide program |
| (3) Accepting some innovations recommended by others without systematic testing | (3) a. Selecting carefully and testing innovations prior to acceptance within each building<br>b. Developing and testing new procedures and materials |
| (4) Accepting pre-student teachers, student teachers, and interns without adequate provisions for their instruction in the school and without adequate supervision by college or other personnel | (4) Conducting pre-service education of teachers and other instructional personnel within some buildings as part of a systematic system-wide and state-wide program |
| (5) Permitting others to use students and instructional staff as subjects for short-term studies that are usually unrelated to instructional improvement. | (5) Initiating small-scale development-based research on instruction and participating with other agencies in descriptive research, controlled experimentation, and comprehensive development-based research. |

Not every elementary school in the future will participate in all of these functions. Each one should be involved in (1), (2), and (3) since these are required for continuous educational improvement. Certain schools within a system might also participate in either (4) or (5), usually not both. A further examination of the three large categories--the instructional system; pre-service and in-service education; and innovation, development and research--is in order.

## The Instructional System

Figure 1 (Klausmeier) shows the major components of an instructional system. The components are now examined briefly in connection with a system of individually guided education. The characteristics of individually guided education and the related Multiunit School organization are subsequently treated in detail.

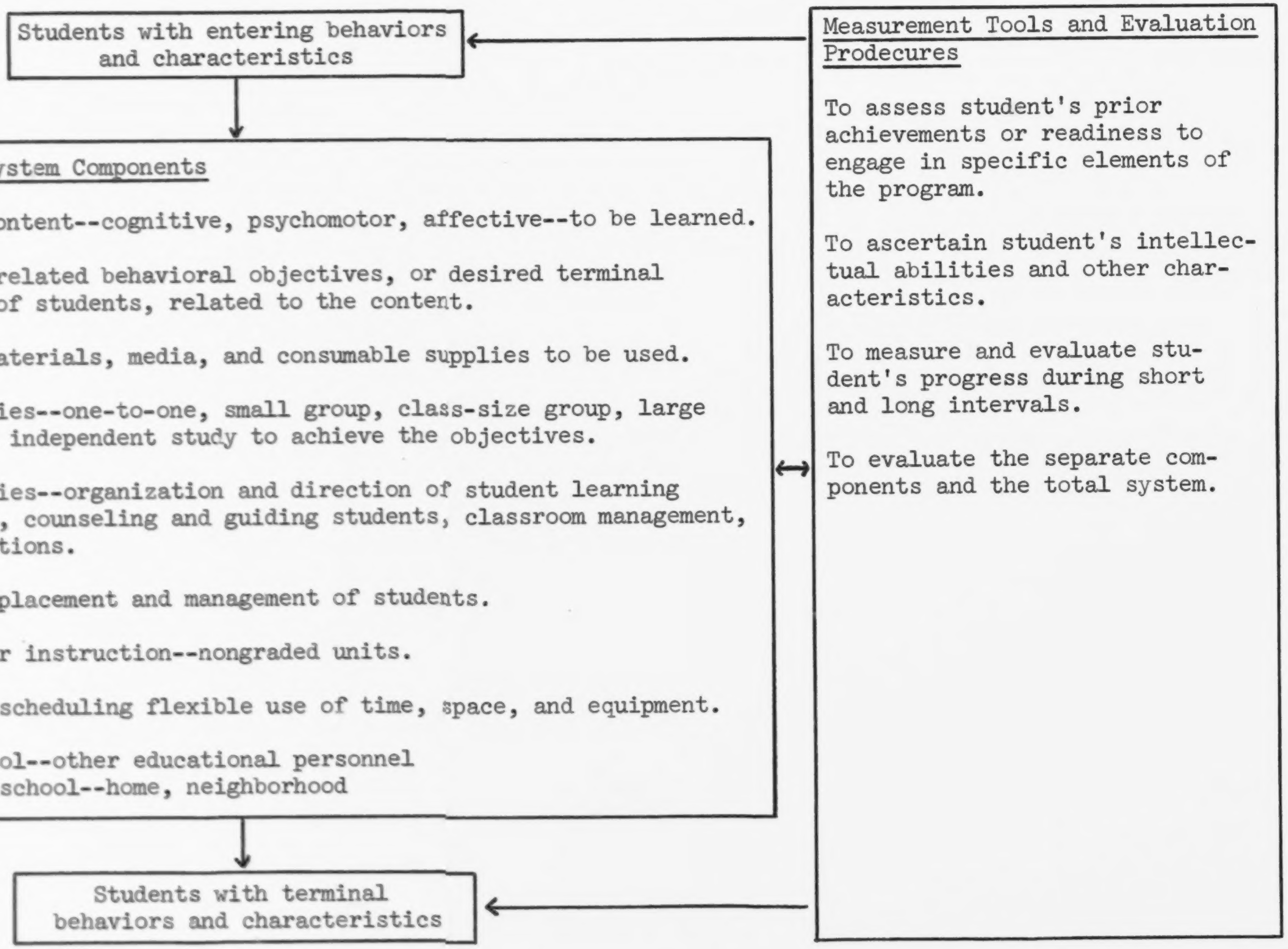
In individually guided education in the Multiunit School a building committee, also called the Instructional Improvement Committee, determines the objectives for the particular school building, taking into account system-wide and state regulations. These are broad institutional objectives for the school building. The staff of each nongraded Instruction and Research Unit, the replacement for the graded homeroom or self-contained classroom, then decides the objectives for each child in the unit. While the unit leader takes the initiative here, each unit teacher also participates. Assessment of the child's characteristics is through observation and by means of locally constructed and standardized instruments of various types. On the basis of the assessment each child is then placed in one-to-one, small group, class-size group, and unit-size group activities. Instruction which employs materials in a one-to-one relation to students, tutorial work, and computer-assisted instruction are examples of one-to-one activities. Activities in small groups of 2 to 15 are organized to attain socializing and also skill objectives. In connection with skill objectives, 150 children in a unit might be placed in 15 small groups for most of their mathematics instruction and then regrouped in another 15 groups for part of their reading instruction. Class-size or homeroom activities are used for achieving any objective where heterogeneity is desired. Large unit groups of 40 to 150 are formed mainly for giving information to the total group or for independent study. The information is given by a teacher, television, sound motion picture, or by other means. Some music and physical education activities are conducted in groups larger than the usual class size. Independent study is carried out in small groups, class-size groups, and large groups.

One implication of individually guided education is that the teacher should be able to plan and lead one-to-one, small group, class-size group, large group, and independent study activities. At the present time, however, complete knowledge has not been accumulated to determine finally how well which educational objectives can be achieved with children of varying characteristics through the different kind of groupings and related activities.

Estimates of the current status regarding each component and hypotheses concerning the future of a system of individually guided education are given next in outline form. Only a few of the component elements that are most likely to change are noted.

Figure 1

MAJOR COMPONENTS OF AN INSTRUCTIONAL SYSTEM



Students with entering behaviors and characteristics

Instructional System Components

An outline of content--cognitive, psychomotor, affective--to be learned.

A statement of related behavioral objectives, or desired terminal behaviors of students, related to the content.

Instructional materials, media, and consumable supplies to be used.

Student activities--one-to-one, small group, class-size group, large group, and independent study to achieve the objectives.

Teacher activities--organization and direction of student learning activities, counseling and guiding students, classroom management, other functions.

Procedures for placement and management of students.

Organization for instruction--nongraded units.

Procedures for scheduling flexible use of time, space, and equipment.

Other: In school--other educational personnel
Out-of-school--home, neighborhood

Students with terminal behaviors and characteristics

Measurement Tools and Evaluation Prodecures

To assess student's prior achievements or readiness to engage in specific elements of the program.

To ascertain student's intellectual abilities and other characteristics.

To measure and evaluate student's progress during short and long intervals.

To evaluate the separate components and the total system.

## 1. Students with entering behaviors and characteristics

| Today | Future |
|---|---|
| Entering behaviors and characteristics are not seriously considered; children are required to adjust to the existing instructional system with little attention to individual differences. | Entering behaviors and characteristics are given primary consideration in relation to each set of learning tasks or activities; instructional objectives and learning tasks are designed for each individual based on his entering behaviors and characteristics. |

## 2. Content and Sequence

| Today | Future |
|---|---|
| The instructional staff accepts content and sequence recommended by others. | The instructional staff of the building, with expert consultation, and within local and state regulations, selects content and arranges sequence on the basis of such criteria as the structure of knowledge of the discipline, difficulty of the material for children, relation to future and current study in school, and relation to out-of-school activities. Appropriateness of content and sequence for each child is based on continuous assessment of children's performance. |

## 3. Behavioral Objectives

| Today | Future |
|---|---|
| Global statements of broad educational goals, developed by outside groups and inadequate for both program development and evaluation, are accepted as the school's objectives. | Educational objectives are developed in sufficient detail to guide program development and evaluation within the school building; instructional objectives are developed for each child. |
| Varying emphasis is given to objectives in the cognitive, psychomotor, and affective domain on a non-systematic basis. | The objectives of the school are clearly stated with respect to the various domains; the objectives for each child are related to the building objectives. |

## 4. Measurement Tools and Evaluation Procedures

| Today | Future |
|---|---|
| Achievement tests or other diagnostic procedures are infrequently | Achievement tests or other diagnostic procedures are developed to assess |

| | |
|---|---|
| developed by the staff to assess a child's present level of achievement and readiness for a learning task. | the child's entering behaviors and readiness related to each learning task or set of related learning tasks. |
| Standardized and teacher-developed tests and procedures are infrequently used to assess the child's progress and to provide informative feedback. | Standardized and teacher-developed tests and procedures are frequently used to assess each child's progress and to provide informative feedback. |
| Measurement tools and evaluation procedures are infrequently used for evaluating the effectiveness of the total system or its components. | Measurement tools and evaluation procedures are used continuously to improve the instructional system, including the components. |
| Computers are rarely employed in interpreting or using the results of tests and other tools for individual appraisal and placement in the program. | Computers are widely used in managing an individually guided educational system. |

### 5. Instructional Materials

| Today | Future |
|---|---|
| Basic textbooks and supplementary textbooks are adopted system-wide, and little additional printed information is available in a school building, resulting in uniform use of material according to grade level, regardless of the characteristics of the children. | A large variety of printed material--textbooks, supplementary textbooks, programed material, library books, unit material--is adopted system-wide. From these the building staff selects that which is appropriate for each child. |
| A limited amount of audio-visual material, mostly sound motion pictures, is distributed from a central location. | A large amount of audio-visual material--sound motion pictures, sound tapes, video tapes, slides, recordings, etc.--is kept within each building; other material is distributed from a central location. |
| A limited amount of material related to various special subject fields, such as foreign language, science, music, and art is available. | Special material related to each subject field is available, much of which is developed locally. |
| Realia from the locality are seldom used. | Realia from the locality are widely used. |
| Material is available only through direct contact. | Material is readily accessible to the children and instructional staff and access to much material outside the building is controlled by computer. |

## 6. Instructional Staff

| Today | Future |
|---|---|
| The principal usually does not assume leadership for instructional improvement. | The principal's first responsibility is instructional leadership. |
| All teachers are expected to be equally competent in all subject fields. | Teachers have a specialty in one broad field of elementary education. |
| All teachers are certified to perform at the same level of professionalism | Teachers are certified for at least four levels--professional or specialist, regular or staff, resident or first two years, and intern as a replacement for current student teaching. |
| There is an occasional instructional secretary or instructional aide. | There are certified instructional secretaries in each building. Instructional aides in each building are certified at two levels according to prior training and experience. |
| The program of a special teacher or of a supervisor in music, art, foreign language is usually independent of the total building program. | Special teachers are part of the building staff, and programs are designed in accordance with the instructional objectives for each child. |
| Few important decisions about major instructional components are made by the teacher. | The staff of the building makes the decisions about all the components of the instructional program, within the local and state requirements; each certified teacher makes important decisions daily. |
| Only a few experienced teachers have the essential subject-matter competence and methodological capabilities to design and execute a program of individually guided education. | The building staff cooperatively designs and executes an individually guided educational program for each child through these primary activities: (a) developing and clarifying instructional objectives, (b) developing and using appropriate measurement tools and evaluation procedures, (c) motivating children, (d) supplying models to imitate, (e) selecting and sequencing subject matter properly, (f) arranging appropriate learning activities including use of materials and equipment, size of group, etc., (g) guiding initial pupil effort, (h) managing practice and activity effectively, (i) aiding |

children to apply and use newly acquired knowledge, skills, and attitudes.

## 7. Student Activities

| Today | Future |
|---|---|
| Students are involved mostly in age-graded, class-size group activities and perform many assignments common to the group. There are few small group and independent activities. | Students participate in one-to-one, small group, class-size, and large group activities to achieve clearly specified school goals and individual child objectives. |
| Children in class-size groups encounter the same amount of material in a certain period of time. | Each child proceeds in skill subjects in one-to-one and small group activities at a rate suitable for him. He engages in small and large group activities to achieve social and other objectives in the cognitive and psychomotor domains. |
| Most effort is directed toward the mastery of skills and the acquisition and recall of factual information. | Moderate emphasis is put on skill mastery and the acquisition and recall of factual information; much emphasis is on concept formation, the application of skills and concepts, creativity, and the evaluation of information. |

## 8. Organization for Instruction

| Today | Future |
|---|---|
| Age-graded, self-contained classrooms of 20-40 children are typical; occasional teams and nongrading are found. | Large nongraded Instruction and Research Units of 75-150 children, a unit leader, other certified teachers, and paraprofessionals constitute the instructional unit. |
| Ad hoc system-wide curriculum improvement committees develop printed curriculum guides. | A permanent Instructional Improvement Committee in each building, comprised of the unit leaders and building principal, makes most of the educational decisions affecting the building. |
|  | Vertical organization facilitates continuous progression of each student. |
|  | Horizontal organization in a unit permits maximum flexibility in placing each child in an appropriate learning activity and also capitalizes upon the capabilities and personal characteris- |

tics of each member of the instructional staff.

## 9. Use of Time

| Today | Future |
|---|---|
| All children spend about equal time daily in connection with the various broad subject fields, e.g., 45 minutes mathematics, 90 minutes language arts. | Each child's time is allocated in terms of his instructional objectives. Variation is found among children in the amount of time spent in connection with subject fields and also with respect to one-to-one, small group, class size, and independent study activities. |
| Each teacher determines time allocation within the limits set by the principal and central staff. | The time of all instructional personnel is planned by each unit with the guidelines established by the building committee. Variation is found in the amount of time spent by instructional personnel according to subject fields, in one-to-one, small group, and other activities, and in planning and development activities away from children. |

## 10. Facility

| Today | Future |
|---|---|
| A separate elementary school building houses 300-1200 children. | Some buildings are separate; others are incorporated as integrated components of educational parks. |
| Equal-sized, box-like classrooms have fixed walls and accommodate about 30 children. | Pods of varying size and shape accommodating 100-200 children permit one-to-one, small group, class size, and total unit activities. |
| The building occasionally has one auditorium, a gymnasium, a lunch room, and a library; some have only one of these. | A large flexible space is designed for noisy and vigorous activities, such as music and gym. Large central instructional resources centers are used for computer terminals, audio-visual equipment, library, and instructional materials of all types. |
| Space is used inflexibly. | Space utilization encourages maximum flexibility and an environment conducive to many types of learning activities. |

### 11. Instructional Equipment

| Today | Future |
|---|---|
| Relatively little equipment is available; occasionally there is an overhead projector, tape recorder, slide projector, sound motion picture projector, and some special equipment for science, art, and music. | Relevant equipment--audio, visual, and audio-visual--is available for presenting information. Relevant equipment is available for the children and teacher to receive information. Integrated systems combine and coordinate the use of various materials and equipment; e.g., language laboratory, multi-media center. |
| | Computers are used to manage integrated systems in which children receive information, respond to it, have their responses analyzed, and receive subsequent learning tasks appropriately selected for each individual. Computers are used for one-to-one instruction to achieve certain objectives. |

### 12. Other Educational Personnel

| Today | Future |
|---|---|
| Central staff curriculum coordinators, school psychologists, research directors, home workers, audio-visual specialists, and others proceed relatively independently, working infrequently with teachers on instructional matters during the school day. | Central staff personnel work often during school hours with the building committee and individual unit leaders in interpreting and implementing system-wide policies and in designing an instructional program for each child. |
| Outside resource personnel from universities, state departments of education, and industry rarely consult with the teacher except to present information to large groups outside regular school hours. | Resource personnel systematically work with unit leaders and other staff during school hours in connection with the instructional and other functions of the school. |

### 13. Home and Neighborhood

| Today | Future |
|---|---|
| A uniform instructional system exists for all children, independent of home and neighborhood backgrounds. | Home and neighborhood are given major attention in connection with the entering behaviors and characteristics of each child. |

| | |
|---|---|
| Principal communication between the school and home is through report cards and principal-parent conferences when difficulties are encountered. | Unit leader and teachers develop a systematic program of parent-school, teacher-home visits. Reporting involves teacher, parent, and child. |
| A PTA deals with peripheral problems, frequently identified by school people. | Parents are brought frequently into the instructional improvement committee and into unit meetings to convey parent values and feelings. |

The preceding outline of hypotheses concerning the future will probably disappoint those who see much more rapid change in connection with technological developments that may be applied to education. The authors see the elementary school as a human and humanizing institution. We have no firm evidence as yet concerning how well children of varying characteristics will learn from one-to-one instruction with a machine or autoinstructional device. Further, we are uncertain as to which knowledge, skills, and attitudes can be initially acquired and retained, or how well what is learned in this manner will transfer to other situations. The authors feel that they are probably on the conservative side.

Many classroom teachers and humanists, however, may be alarmed by the projections. It is possible, of course, that there will be available the adult human beings and the monetary resources to have much one-to-one instruction occurring between a child and an adult without resorting to expensive computers and other autoinstructional devices. The precise input of material and human resources into an effectively functioning system of individually guided education cannot be predicted reliably. One conclusion is warranted, however. At present many schools are not providing quality education for many children. We should not defend or maintain the outmoded practices and philosophy represented in the preceding statements in the left column. Individually guided education is both possible and essential.

As will be mentioned in the next sections of this introduction, in-service and pre-service teacher education must be drasically changed and quickly improved. Also, involvement of the local schools in innovation, development, and research is essential for systematic educational improvement.

## In-service and Pre-service Teacher Education

Although large sums of money are going into in-service education which is considered highly important by teachers and others, there are few well-planned local, state, or national programs. Recent federal legislation provides considerable funding for in-service education. The federal government also has initiated developmental and demonstration programs for pre-service education. Some estimates of the current situation and hypotheses for the future are now outlined.

## In-service Education of Instructional Personnel

| Today | Future |
|---|---|
| Objectives are poorly defined by local, state, and federal agencies and other groups. | Clearly specified objectives are drawn up by local schools and a relevant state agency. |
| Programs on a variety of topics are poorly planned without consideration of a total integrated system of in-service education. | A statewide program is designed by local school systems and a relevant state agency. |
| Credit classes are offered to anyone who desires them, including many first- and second-year teachers who do not continue teaching and other experienced teachers whose primary interest is securing a higher salary or maintaining certification for teaching. | Credit classes are offered during the school year and summer only to those who have some teaching experience, who intend to stay in teaching as a lifetime career, and whose primary objective is to improve children's learning opportunities. |
| Non-credit classes and other activities are offered outside of school hours by personnel from universities, departments of public instruction, industry, etc. | Non-credit activities are offered during school hours in school buildings by personnel within the building. Consultants focus their in-service efforts on the principal and unit leaders. The principal and unit leaders, in turn, provide most of the on-the-job training for the other unit personnel including the teachers, secretaries, aides, and technicians. |
| The principal evaluative criteria are the teacher's attending in-service activities with reasonable regularity, participating in a minimum number of activities, and not expressing unfavorable opinions. | Measurement tools and evaluation procedures are directly related to objectives and provide information about individuals and program improvement. |

## Pre-service Clinical Experiences of Teachers

| Today | Future |
|---|---|
| Student teaching is done for less than full days and often less than a semester. | A year of full-time internship is done. |
| Student teaching is done with one teacher, thus providing a limited acquaintance with one teacher's methods. | Internship is done during consecutive semesters in two units under the leadership of two unit leaders, thus providing experience with the personalities and methods of two qualified unit leaders and several teachers. |

| | |
|---|---|
| The student teacher has acquaintance with one limited instructional program. | The intern participates in implementing a total system of individually guided education. |
| The student teacher has no opportunity to participate in innovation, development, and research. | The intern participates in all the functions of the unit. |
| The total building environment has not been designed to provide an excellent pre-service experience. | The total building environment facilitates the professional development of the intern and induction into the profession of teaching. |
| The cooperating teacher has little time during the day to spend with the student teacher. Supervision and evaluation of the student teacher is by college personnel who do not regard supervision highly. | The instructional improvement committee and the unit leaders have time during the day to develop an individualized program with and for each intern. |
| | The intern is paid about 40 percent of a beginning teacher's salary by the local school and that portion of the salary of the unit leader given to leadership of the interns, up to one-third for three interns, is paid by the relevant state agency. |

## Research and Development

The capabilities of a building staff of the future to engage in a variety of research and development activities cannot be estimated reliably at present for two main reasons. First, research and development strategies are in the early stages of formulation, the first systematic large-scale attempts at improving educational practice through research and development being of very recent origin. Second, not having clearly defined strategies, current school personnel have not received relevant education concerning research and development. Based on three years of experience in research and development activities in instructional and research units, we have delineated five types of research and development activities that can be executed effectively in Multiunit Schools.

First, there is research on promising instructional materials and procedures. Here the school staff identifies a procedure or material, tries it out, and evaluates it. They learn how much skill is required on the part of the teacher to use it, how much time is required on the part of the pupils, how well the teachers like the material or procedure, how well the children learn from it, and the like. Pre- and post-tests may be used. This evaluation of materials and procedures can be done by the building staff with relatively little outside assistance. The central staff supplies consultant help when needed, however.

A second kind of research deals with the same problem, that is, determining how well a material or procedure and usually a combination of the two works. Here, however, a controlled experiment is conducted, usually involving a latin square design. The entire unit population may be stratified according to sex, achievement level, or other relevant bases. They are subsequently assigned randomly then to two or more treatment groups. The treatment groups remain the same. However, the instructional staff rotates among the treatments so that the effect of treatment on children is essentially controlled rather than confounded with teacher effect. Expertise is required in designing, executing, and reporting a controlled experiment which most current unit leaders do not seem to be able to get except with extended education.

A third type of research and development is what might be called short-term, development-based research. Here the school develops something and continuously refines it through research as outlined above. School personnel generally need assistance in developing content and sequence and related behavioral objectives. Most present unit leaders do not have the necessary subject matter knowledge and also need initial assistance in formulating behavioral objectives.

A fourth type of research and development involves long-term development and refinement of curriculum materials and procedures related to reading, mathematics, science, and other subject matters. Some agency, such as an R & D Center or teacher education institution, leads this activity. It is a kind of combined development and research activity which unit leaders and teachers can participate in well but usually cannot initiate and execute independently. They assist in all phases of the development and the subsequent controlled experimentation to determine how well the new instructional system works. Subject matter specialists, methodologists, and behavioral scientists provide the essential input of substantive and procedural knowledge.

A fifth type is short-term horizontal descriptive research or controlled experimentation, executed to secure data for the researcher. Usually this research is unrelated to the instructional program of the school and the results often have neither immediate nor long-term implications for improving individually guided education in the school. Although this is the case, the research may be of high significance in extending knowledge about a component of the instructional system, refining theory, or contributing to some other cause. Also, data are often collected to secure useful information about children's interests and other characteristics, teacher characteristics, leadership behavior, and other phenomena, all of which eventually may bring about better education.

Long-term predictions regarding the function of the local school in research and development are therefore tentative. Three important variables that will determine the amount of participation of local schools in research and development are: the amount of federal money available for this purpose; the number of capable personnel who will commit themselves to this type of activity; and the commitment of local schools. Local school systems, teacher-education institutions, and state education agencies have been very slow in realizing that educational improvement requires continuous research and development, similar to that which is done in agriculture, medicine, industry, and space.

## II. The Multiunit School Organization

The Multiunit School Organization includes both a formal organizational structure and a procedural style consisting of several essential components. Figure 2 (Klausmeier) illustrates the formal organizational plan of a Multiunit School of 600 students. The organizational hierarchy of the Multiunit School consists of groups at three distinct levels of operation.

At the classroom level are the Instructional and Research (I & R) units. Each I & R unit has a unit leader or professional teacher, two or more regular staff teachers, one or more aides or secretaries, and in some cases an intern. The intern assumes instructional responsbilities and does not perform routine and clerical duties. Each unit is charged with planning and conducting the total school experience of about 150 students.

Unit meetings are held once weekly and more often if necessary. A unit meeting may last from 30 minutes to a half day. The meetings are devoted to planning and evaluating the total instructional program for the children of the unit and require the attendance of the certified members of the unit. The agenda, written or mental, is supplied by the unit leader.

Units now in existence use one of three methods to secure time for unit meetings: 1) by scheduling special teachers (art, music, physical education) into a unit en bloc, the unit members can be freed twice or three times weekly; 2) by arriving early at school and deploying teacher aides to supervise homeroom or large group activities, the unit can meet from 30 to 45 minutes daily; or 3) by lengthening four school days during the week, students can arrive at school late or be dismissed early on the fifth day, thus freeing the unit to meet for about two hours. Each of these solutions has advantages and disadvantages, and other solutions are possible. It is essential that sufficient time be found for unit meetings. At least two hours per week appears to be necessary during the first year.

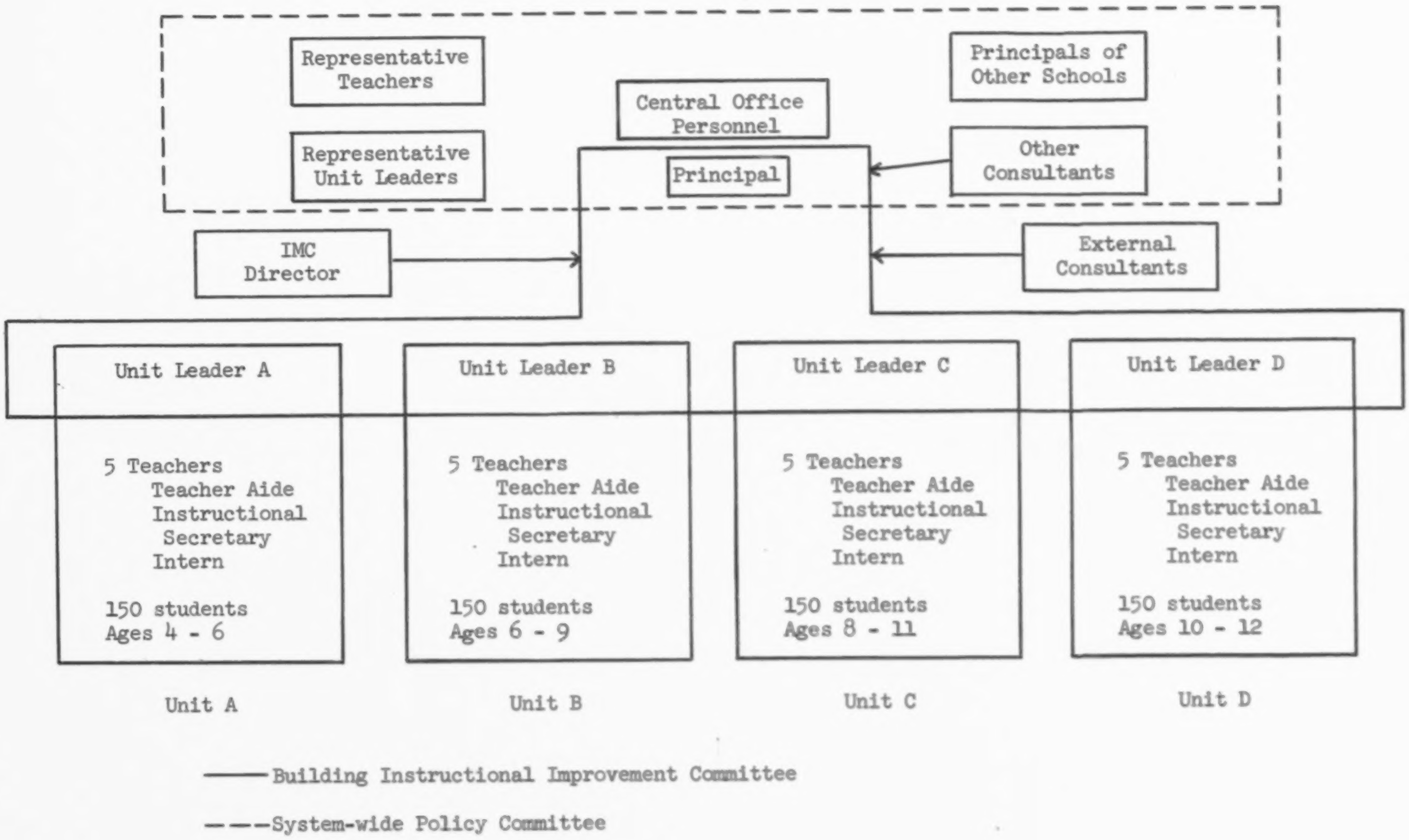
At a second level of organization, the principal and the unit leaders constitute the permanent Instructional Improvement Committee of the building. The principal chairs the group, which meets weekly, more often if necessary. This committee may bring in consultants from the central office, the state education agency, or other agencies. Instructional decisions made by the committee are executed in the units.

At the third organizational level is the System-wide Policy Committee. Chaired by the superintendent or his designee, this committee includes representative principals, unit leaders, teachers, consultants, and other relevant central office staff. It meets less frequently than either of the other groups, but its operation is one key to the success of the Multiunit School.

The organizational pattern of the Multiunit School thus differs from that of the traditional, self-contained classroom school in several ways. First, in the Multiunit School personnel work in units or committees, rather than in isolation as is the case in the traditional school. Second, three new roles are added: unit leader, teacher aide, and instructional secretary. Finally, the addition of new roles and the use of personnel in groups rather than alone results in considerable redefinition of the familiar roles

Figure 2

ORGANIZATIONAL CHART OF A MULTIUNIT SCHOOL OF 600 STUDENTS


Representative Teachers
Representative Unit Leaders
Central Office Personnel
Principal
Principals of Other Schools
Other Consultants
IMC Director
External Consultants
Unit Leader A
Unit Leader B
Unit Leader C
Unit Leader D
5 Teachers
Teacher Aide
Instructional Secretary
Intern
150 students
Ages 4 - 6
Ages 6 - 9
Ages 8 - 11
Ages 10 - 12
Unit A
Unit B
Unit C
Unit D
Building Instructional Improvement Committee
System-wide Policy Committee

of principal, teacher, and consultant. More precise role descriptions are provided later in this paper.

Organizational charts and role definitions yield an incomplete portrait of the Multiunit concept. The processes which take place within the formal structure need further description.

As indicated, each R & I unit is charged with the total educational experience of about 150 children. The children are placed in units primarily on the basis of years in attendance; however, there is considerable overlapping in age of the children. Within each unit, grade lines are completely abandoned as children are assigned to one-to-one, small group, class-size group, and unit-size activities.

The instructional process in each unit is determined by the staff cooperatively. The assessment of characteristics of each child, the development of objectives, the selection of content and activities, the placement of each child in relevant activities, and the means of evaluation are decided jointly. This process allows all the children in the unit to benefit from the strengths of each teacher in the unit; e.g., mathematics instruction, normally a weakness in most self-contained classrooms, can be improved because three or four unit members can pool their knowledge to develop optimal instruction in mathematics, or one teacher, strong in mathematics, may do most of the teaching until the others gain more competence. The unit may invite consultants to assist them in planning and excuting the instructional program. The consultant's time is used more efficiently in the unit than in the traditional pattern. The consultant meets with the unit staff during regular school hours, not before or after school.

Planning for instruction and cooperative effort are crucial in unit operations. To plan activities, the unit staff assesses each child's level of achievement, progress, and other characteristics. These assessments tend to be more accurate when the professional knowledge and skills of three or four teachers, rather than one, are brought to bear. Based on the assessment, each child is assigned to some large group, class-size group, small group, and one-to-one activities in order to achieve the school's goals and each child's instructional objectives. Equally important, the teachers decide cooperatively who will perform which activities.

Noninstructional tasks (preparation of materials, etc.) are identified, and such tasks are performed by the aide and instructional secretary. These nonprofessional personnel are trained and directed primarily by the unit leader. They work directly with the staff teachers and children. During a school year, there is much planning and related redeployment of the unit staff and also planning and reassignment of students to activities in order to capitalize upon staff capabilities and to provide the best learning opportunities for students.

The Instructional Improvement Committee of the building meets weekly and, since the schedules of the unit leaders and principal are more flexible, they experience little difficulty in finding time to meet. The agenda at these meetings are formulated by the principal in consultation with the unit leaders and avoid the routine matters too frequently associated with faculty meetings. Parenthetically, it should be noted that a principal's bulletin and occasional after-school staff meetings may still be required.

The functions of the Instructional Improvement Committee may be considered at three levels: interpreting and synthesizing system-wide and statewide policies that affect the instructional program of the building, developing the broad outlines of the instructional program--all its components--for the school, and coordinating those uses of facilities, time, material, etc., that units do not manage independently. It thus has both policy development and management, but not supervisory functions. Policies and guidelines developed by the Instructional Improvement Committee are transmitted to the unit staff by the unit leader. In turn, the highly significant decisions regarding an appropriate instructional program for each child are made and executed by the certified teachers of the unit.

The Instructional Improvement Committee draws upon specialists from the central office and the state education agency in interpreting system-wide and statewide policies and guidelines. Curriculum consultants, psychologists, social workers, and others consult with the committee. The school buildings involved in pre-service teacher education or long-term research utilize relevant university, state department, or other personnel. A most important element in the success of the Multiunit School is the ability of the building committee to secure relevant consultants during school hours for periods of time up to a half day. Further the entire committee, or any member of it, may leave the building to secure relevant information.

In Figure 2, the major components of an instructional system were outlined. The Instructional Improvement Committee deals with all these components. No sharp line can be drawn to set off the responsibility of the building committee and the unit personnel in these matters. How much responsibility to give any unit will in part depend upon its capabilities. In general the Instructional Improvement Committee makes certain that each unit leader has the information about each component that is essential to effective unit operations. Thus the committee takes the leadership in identifying or developing objectives, measurement tools and procedures, instructional materials, a plan for devising relevant pupil activities and groupings, and the like. The committee transfers as much responsibility as quickly as possible to the units. The principal, as the school leader, assures himself that each unit executes the total school program effectively.

The coordinating function of the Instructional Improvement Committee is crucial, especially in connection with the flexible use of materials, time, space, equipment, and special personnel such as the librarian, music teacher, and speech therapist. The needs of each unit for instructional material, tests, space, assistance with instructional problems, etc., are the proper concerns of the Instructional Improvement Committee. Any functions other than those associated with instructional improvement are also the responsibility of the Instructional Improvement Committee, for example, pre-service teacher education and research and development activities. The building committee, in cooperation with the System-wide Policy Committee, may also arrange the meetings of each unit during school hours.

The System-wide Policy Committee establishes the broad policies and guidelines for the Multiunit Schools. The four primary concerns of this committee are the functions to be served in the Multiunit School, personnel, material, and information service.

The System-wide Policy Committee, with the building principal and unit leader, decides the functions, in addition to curriculum improvement, to be performed in each Multiunit building. After this decision is made, the System-wide Policy Committee makes sure that the necessary material and human resources are made available to the school and that the functions are properly interpreted to the school board and community. New functions, roles, and processes require understanding by the entire school staff and the community. Guidelines are drawn up by the System-wide Policy Committee which indicate the role of this committee and the building staff.

Personnel are essential to a successful Multiunit operation--a capable building principal, excellent unit leaders, certified teachers who are compatible in their roles, and other personnel. The System-wide Policy Committee develops recruiting and transfer policies that make it possible to have effective operations. Initial recruiting of a cooperative staff is essential. Further, a building principal, a unit leader, or a teacher may find the Multiunit School uncomfortable after a semester or year. The System-wide Policy Committee deals with these and other personnel matters.

Material resources are essential to individually guided education. The System-wide Policy Committee takes care of matters such as remodeling an old building, arranging for an instructional resources center, providing programed instructional materials, etc. When the Multiunit School serves the system as an experiemental or demonstration school, the additional materials are made available.

This brief description of the Multiunit School serves to illustrate several basic components which are required for the successful operation of a Multiunit School. Any of a number of variations of the formal organizational structure are possible, and indeed desirable, if the structure is to fit local needs. The following process components are essential.

First, whatever the number and size of units, each unit must plan, instruct, and evaluate cooperatively. A quasi-unit, which meets only to coordinate individual plans, is insufficient to the task. Optimal unit operations are based upon the cooperative exchange of expertise and the division of labor according to talents. In self-contained classrooms, labor is duplicated rather than divided; i.e., all teachers perform the same tasks, with differential success and in isolation.

Second, in the Multiunit School, important instructional decisions must be made by groups and at the appropriate level in the organization. In the traditional school, such is usually not the case. Often, decisions about curricula are made at the central office level and imposed without regard to differences among schools. In other cases, such decisions are made by individual classroom teachers, who lack the competence to make them and whose independent decisions result in loss of coordination and efficiency. In the Multiunit School, decisions with impact for a certain age range of children are made by units, rather than by individual teachers. Decisions with building-wide impact are the responsibility of the Instructional Improvement Committee, and those with district-wide application are made by the System-wide Policy Committee. This more logical decision-making pattern requires that some decisions traditionally made in the central office be decentralized, and that some formerly made by individual teachers be centralized. Furthermore, the principle of group decision-making leads to a wider choice of alternatives, higher quality decisions, and more effective implementation.

Third, the Multiunit concept presumes greater role differentiation and role clarity than is the case in the traditional school. The educational task, formerly assigned in toto to each teacher, is factored into its developmental, instructional, and noninstructional parts. These in turn are assigned to personnel according to their competencies: i.e., to the principal and the unit leader, the teacher and the nonprofessional aide. The consultant's role is redesigned for its original purpose--to provide advice (not to act as substitute teacher or critic) at the moment advice is needed. Central office personnel function as advisors and supporters in the Multiunit plan, not as mandators and monitors as so often has been the case.

Fourth, the Multiunit concept rests upon a carefully designed leadership structure. In the traditional school, leadership is assumed to be the function of the principal. It usually fails in that setting for two reasons: 1) the principal is expected to lead too many persons without assistance--i.e., his span of control is much too large; and 2) neither the principal nor the staff have time during the day when the principal's leadership may be exercised. The Multiunit School provides formal leadership for each small group of personnel: the unit leader leads the two or three aides, and also the three to five teachers in her unit; the principal's leadership is exercised primarily with three to five unit leaders. Furthermore, each group--aides, unit teachers, or Instructional Improvement Committee--meets with its leader regularly during school hours. There is time for leadership to have effect.

Finally, communications flow in a Multiunit concept is more adequate than it can be in the traditional school. In the latter, communications are usually written, often authoritarian in tone, and are commonly vertical in direction. The work environment of the Multiunit School provides oral communication as well, and horizontal and vertical channels open naturally.

The combination of all these features changes the school tone remarkably. The traditional, self-contained classroom school is a collection of isolated functionaires performing the same tasks, and lacking either time or stimulation to alter their performance substantially. The situation is subdued and static. The Multiunit School, by contrast, is characterized by flexibility, cooperativeness, and a spirit of inquiry. Change is inevitable because professional interaction requires it, and there is more time to plan, test, and implement it.

Our position can be summarized this way: the Multiunit School concept consists of an organizational format and certain necessary procedural elements. The structure permits the processes to occur, and the structure and process together produce a dynamic and highly effective environment for children's learning and for professional development of the entire instructional staff.

## III. Staff Roles in the Multiunit School

A significant characteristic of the Multiunit School is the changed roles of the professional personnel. The description of the elementary school of the future presented in the introduction provides some valuable clues about the roles of the principal, unit leader, other certified teachers, and paraprofessionals. These roles are becoming reasonably well delineated in current Multiunit Schools. The descriptions that follow are based upon continuing interactions among personnel of local schools, the R & D Center, and the Department of Public Instruction.

### The Principal

The role of the principal is changed in the Multiunit School in two ways. First, he assumes greater responsibility for the various functions not common in the elementary school of today. That is, he takes greater leadership in connection with initiating and refining the system of individually guided education, managing the pre-service and in-service teacher education activities in his building, and administering the research and development activities. Second, he organizes and chairs his building committee, arranges for its meetings, and sets the agenda of the meetings. This in turn provides the mechanism and communication system through which the principal executes administrative leadership in connection with the three functions of the school. The purpose here is not to define all categories of administrative responsibilities of the principal. Rather, his work in connection with the building committee and the three functions are emphasized.

The building committee, as noted earlier, is comprised of the building principal and unit leaders. It meets at least weekly and makes decisions regarding the instructional program, teacher-education program, and the program of research and development conducted within the building. In connection with any of these programs, special teachers and other personnel within the building, consultants from within the school system, and consultants from outside the system are secured to provide assistance to the building committee. The principal is responsible for all these matters; however, he may delegate certain matters to the unit leaders and others to the consultants. For example, a unit leader might assume responsibility for formulating an initial statement of the school's objectives in a subject matter field, or the representative of a higher education institution might be delegated responsibility for designing an experiment or for writing an initial statement of the professional activities of the intern. It is not assumed that the principal is the expert in any subject field, in research design, or teacher education. He is responsible, however, for arriving at decisions on these and other matters with his building committee and for their execution in his building.

Earlier in Figure 1 the main components of a system of individually guided education were indicated. From these, the areas of decision making by the building committee may be readily inferred. In turn, the descriptions of the components provide an indication of the substantive concerns of the building principal as he works with his committee. What are the responsibilities of the building principal with respect to knowledge about each component and getting the component properly executed so that children learn well?

Much variability is found and expected among building principals in knowledge and administrative style. With respect to content of instruction, instructional materials and media, student activities, teacher activities, evaluation of student performances, and procedures for the placement and management of students in a system of individually guided education, the unit leaders collectively are expected to have more knowledge than does the building principal. Each unit leader typically has a masters degree with some specialty in a broad subject matter field, thus the building principal must rely heavily upon his staff and consultants for the knowledge base of these decisions. The principal is expected to be strong in connection with organizing instruction; scheduling time, space, and equipment; dealing with educational personnel both within and outside the building; dealing with parents and other publics; evaluating the building staff; and, most important, securing the essential conditions for his staff to carry out their responsibilities. A few examples illustrate the key role of the principal.

With regard to staffing, the principal assumes the supervisory and evaluative responsibilities of all the staff, including the instructional aides and/or secretaries. Individual staff members are responsible to him. In choosing the personnel to work in the Multiunit School the principal should recognize that the units should be staffed by teachers who want to be in the unit. A beginning teacher, another with a year or two of experience, a mature teacher who does not desire leadership of the unit and related responsibility, and a vigorous unit leader more quickly organize effectively than does a group of seasoned teachers of many years of self-contained classroom experience. At least a year must be allowed for teachers with no previous experience in cooperative planning to become an effective unit, and during this time of adjustment the principal must give necessary and effective support. Moreover, in the event a teacher no longer wishes to work in such an organization, a suitable means is arranged for that teacher's transfer. Finally, the central staff and building principal must agree on how and when to replace a unit leader, a teacher, or aide who for any reason seriously impedes the functioning of the unit.

Securing instructional materials and equipment is another important contribution of the principal. Since education in the Multiunit School is guided individually, it is necessary to provide a wide range of instructional materials and resources and to assist the staff in developing materials.

Utilizing consultants significantly facilitates unit operations. In the Multiunit School the utilization of consultants from within and outside the system is facilitated since they meet with the building committee and units during the regular school hours. How well the special teachers, psychologists, and others work in the building is a major responsibility of the principal.

Certain personal characteristics are essential if the principal is to execute his leadership role effectively. In addition to being well informed about the concepts inherent in the Multiunit School and about the instructional program, the principal manifests enthusiasm for the organization. He is supportive of the unit leaders and the unit staff. It is well to add here that in the Multiunit School the principal can be more supportive because of the improved communications that enable him to be better informed about the plans and problems of the instructional staff. Encouragement and support of the staff from the building principal are especially critical when decision making is slow and when best efforts do not meet with immediate success. Besides being well informed, enthusiastic and supportive, the principal must be able to utilize group problem-solving techniques skillfully in a cooperative venture.

In the preceding discussion, the role of the principal in administering a system of individually guided learning has been outlined. He has a similar role in research and development and teacher education. In general, extensive knowledge is not assumed. However, utilizing the best knowledge available within his staff and consultants, delegating appropriate responsibilities, and arriving at group decisions which can be implemented effectively are important capabilities of the principal of the Multiunit School.

## The Unit Leader

The unit leader has responsibilities as a member of the Instructional Improvement Committee, as a leader of a unit, and as a teaching member of a unit. Thus, the role of the unit leader is instructional, not administrative or supervisory. His leadership role is in planning and coordinating. He serves as a liaison between the unit staff and the principal and consultants. He coordinates the efficient utilization of the unit staff members, materials, and resources. As a member of the Instructional Improvement Committee, he also contributes to developing the instructional program of the building.

As the coordinator of the activities and resources of his unit, the unit leader is responsible to the building principal for planning and executing the instructional program of the unit; however, the unit organization permits each teacher to share fully in the planning and execution. As the unit develops individually guided education, the unit leader takes the initiative for the unit's dealing successfully with all the components--objectives, content, materials, student activities, utilization of time, and utilization of spaces. The principal, of course, assists. Similarly, consultants from other sources such as state education agencies or universities, special teachers of art, physical education, and music also participate in planning unit activities. Other contributors include the school psychologist, guidance personnel, and social workers.

In executing individually guided education, the unit leader makes certain that throughout the school day each child is engaged in an appropriate one-to-one, small group, class-size group, or unit group activity. He also insures that throughout the day each staff member of the unit is engaged in an appropriate planning, management, or instructional activity and that space, time, material, and equipment are being used advantageously. When sufficient time is available for the unit to plan, and when it is used well, the unit staff develops the details essential for smooth functioning of the instructional program. It is the unit leader, however, with assistance from the building principal, who must know which questions to raise in order to secure appropriate planning and action from the unit personnel.

The unit leader also teaches, demonstrates to other unit members, and assists unit members who may experience difficulty. Often the unit leader gains familiarity first with new material or a procedure and tries it out. Finally, other certified staff members may need time to plan, review, and the like. The unit leader does some teaching so that unit staff also can plan and review.

The preceding outline has dealt only with instructional improvement. Other functions of the unit may include pre-service teacher education, participation in cooperative research and development, and systematic in-service education. Here, also, the role of the unit leader is to exercise initiative and assume responsibility in a manner similar to that for the instructional program.

Certain personal characteristics and qualifications are deemed essential for the unit leader. The most obvious characteristic is leadership ability. He must be able to relate to the principal and consultants as well as to his staff in such a way that he can effectively communicate and coordinate activities and gain the trust and confidence of his peers and superiors. Confidence is achieved largely through demonstrating higher competence, more knowledge, and greater effort in comparison with most classroom teachers. The unit leader must also be willing to continually improve his professional capabilities by pursuing further education and gaining relevant experience during the school year and summer. Unit leaders should be chosen from those teachers who are committed to a career of teaching, who desire additional responsibilities which will require them to work eleven months, and who continuously and systematically extend their knowledge and capabilities.

The competencies expected in the unit leader differ to some extent with the activities intended for the unit. Generally, however, he should have graduate training in the areas of learning, a curriculum field, and research methods. A positive attitude toward research, development, and innovation is essential. Flexibility and inventiveness in the adaptation and development of methods and materials are also important.

## The Teacher

The main differences between the roles of the certified teacher in the unit and the teacher in the self-contained classroom are in planning with other members of the unit, working with many children and with other unit members rather than working with a smaller number of children independently, and performing at a more professional level. The higher level of professional activity is manifested in research and development activities, pre-service teacher education, and in several components of the instructional system, such as formulating objectives for each child, assessing each child's characteristics, using new materials and equipment, and trying out new instructional procedures. The first-year teacher and the teacher new to a unit are not expected to become proficient in all these during a short time interval. This is one of the advantages of unit teaching. The unit leader, building principal, and teachers together decide what they can accomplish and proceed accordingly.

The most important rewards to the teacher in a unit are participating in all the relevant functions of the school, engaging in decision making about all components of the instructional program, making a maximum contribution according to one's strengths and interests, being relieved of non-professional activities by aides and secretaries, and having a stimulating learning and teaching experience. Teaching in a unit is strenuous at times but is always mentally stimulating and emotionally satisfying.

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For some, teaching in the unit may threaten loss of autonomy. It can be argued, however, that autonomy and freedom are increased as the teacher grows professionally through the exchange of ideas. Feedback from other teachers and opportunities to experiment stimulate and motivate the teacher to do great things. In the environment of the Multiunit School the teacher realizes that joint planning and evaluating are vital to a more complete understanding of the teacher-learning process and to an effective program of individually guided education.

In individually guided education the teacher is involved in developing and clarifying instructional objectives, designing and executing a program based on the assessment of each child, and then continuously evaluating the child's progress and the program. To accomplish this the teacher manages more information than previously as profiles for each student are kept. The Multiunit teacher is sensitive to individual learning problems and uses assessment evidence to judge which kind of activity is best for a child. The teacher must be able to choose from a wide range of available materials and to develop materials in the event that appropriate ones are not available. He should understand the basic concepts and skills in at least one broad subject field and, within a subject field, be able to arrange a valid sequence of the content.

## The Intern

The intern of one semester is usually assigned to one unit for the entire semester. The intern of two semesters is usually assigned to two units, changing from one to the other at the end of the first semester. This works best when at least two interns are in the same school. A larger instructional and research unit may readily incorporate two interns per semester. Thus, a school of about 700 students enrolled in five units may have 10 semester interns each semester, 20 during the year.

Pre-internship observation and participation may also be carried out effectively in the Multiunit School. This should probably not be done in any unit where there is already an intern. The pre-service teacher education function must not be permitted to overshadow the instructional improvement and the research and development functions. Caution must be exercised so that many personnel from different agencies with varying objectives do not divert too much time and attention of the building staff from the program of individually guided learning for the students.

The intern engages in professional activities, not in routine or clerical duties. The latter are performed by the instructional secretary and aide. The intern participates in the workshop preceding the opening of the school term, thus securing an overview of the specific instructional, pre-service, in-service, and research and development functions performed in the unit. Also, the intern becomes acquainted with the roles of the various unit and building personnel.

In connection with the instructional program, the objective is for the intern to engage at first in observation and minor participation but to move rapidly to full responsibility at a level similar to that of a beginning certified teacher. A well prepared intern who has had pre-service participation in a school and in a building workshop before the opening of school may assume full responsibility for one-to-one, small group, and class-size group activities within two weeks after the opening of school. The intern does not assume decision-making responsibilities for the instructional program of the unit as do the unit leader and experienced teachers. However, the intern does execute decisions and also participates in unit meetings.

One major attraction for the intern in the Multiunit School is participation in a research and development activity. As described earlier, a unit may be involved in relatively elementary but significant research on curriculum materials and instructional procedures or in more sophisticated experimentation. Teacher-education institutions or other agencies assist smaller schools that do not have within-system capability for initiating relevant research and development activities in the unit.

## Instructional Secretaries and Teacher Aides

The two main classes of non-certified members of units are instructional secretaries and teacher aides. The wise use of their abilities and previous background is the responsibility of the unit leader in cooperation with the building principal and the unit staff. The instructional secretary performs a number of clerical responsibilities such as keeping attendance records, collecting and keeping records of special money from the students, duplicating materials, making lists of pupil supplies, typing, and filing.

The precise responsibilities of teacher aides vary greatly and are directly related to the background of training and experience of the aide. For example, the aide with a college degree in a subject field such as science will perform functions different from the high school graduate who has had no work in science after the ninth grade. Even though no common set of specific activities can be prescribed, there are some areas in which aides can participate. They may perform many housekeeping chores connected with lighting, ventilation, cleanliness, instructional materials, supplies, chalkboards, plants, etc. Also, an aide may provide assistance to children in caring for clothing, moving from one part of the building to another, or receiving attention from a specialist such as a nurse or social worker. Lunchroom and playground activities may also utilize the service of an aide.

With regard to individually guided education, teachers have found aides especially helpful with one-to-one, small group, and independent activities. In connection with reading, for example, an aide with relevant education and personal characteristics may assist the unit leader and teachers in (1) administering and scoring group tests and other assessment procedures, and in recording the results and maintaining a record of each child; (2) managing the instructional materials--securing instructional material and equipment, already identified by the unit staff that the child will use in attaining specified objectives, returning, filing, and storing it; (3) assuring that each child learns well by using the material--an aide may assist with mechanical matters, with content that may be exceptionally difficult, and provide encouragement and reinforcement; (4) assuring that each child learns well from oral reading activities--an aide may listen to and provide information needed for the child to progress, reinforce correct responses, and inform the teacher of learning difficulties; (5) assuring that each child learns well in small discussion activities, silent reading activities in other subject fields, etc.,--an aide may receive and answer some questions, refer others to the teacher; and (6) recording each child's progress toward achieving all the objectives of the reading program. This is not a complete listing but suggests the activities of an aide in connection with various components of a system of individually guided reading as noted earlier in Figure 1.

## IV. Implications

This paper has discussed so far the state of current elementary education, projected some of its future directions, explained the structural and procedural components of the Multiunit School organization, and discussed in detail the roles and responsibilities of personnel in such an organization. It is our position that the Multiunit approach, or one very similar to it, is necessary if elementary education is to develop in the desired directions.

### For a System of Individually Guided Education

The Multiunit approach provides a highly effective means of monitoring the entering behaviors and characteristics of students. Several factors contribute to this: each unit cooperatively plans the learning tasks of its own children, and to do so it must focus attention on the characteristics of each child in relation to the school's objectives; the combined judgments of several professionals are applied to the assessment of each child's entering behaviors and characteristics; and each child enters a higher unit with a record of his previous unit members' judgments of his accomplishments and characteristics. In short, initial assessment is done by a group of professionals for each child in the Multiunit School.

Multiunit flexibility includes the ability to adapt content and sequence to each building, each unit, and each child. Expert consultation is more readily available and more efficiently used. Regular unit meetings insure instruction in line with each child's characteristics and the school's objectives. The Instructional Improvement Committee is a permanent coordinating mechanism, assuring within-school articulation and sequence of content.

Objectives are usually stated in behavioral terms only when teachers feel required to do so and when they can receive the expert assistance they need. However, precisely stated objectives are essential to both program development and evaluation. Assistance is available through the Instructional Improvement Committee in a Multiunit School and balance and comprehensiveness of objectives are assured.

Cooperative planning of a system of individually guided education at both the unit level and the building level demands the systematic use of standardized achievement and other instruments to assess initial behaviors, periodic progress, and terminal behaviors. The Multiunit School tends to adopt published instruments and to supplement them with locally-produced devices, rather than to adopt published instruments only.

Because of its operational mode, the Multiunit School instructional staff abandons the single text-workbook approach in favor of multiple texts, a wide variety of audio-visual materials, and a heavy dependence upon teacher-developed materials. Such an eclectic approach is almost inevitable where professional differences of opinion are regularly expressed and accommodated. When computer-assisted instruction or other forms of programed instruction become widespread, the Multiunit approach offers a reasonable guarantee that programing will remain under proper human control.

Dramatic differences in the roles of personnel occur in a Multiunit School. By creating paraprofessional positions, the roles of teacher and unit leader are redirected towards ~~their~~ primary competency in instruction. The unit leader and principal assume leadership functions by necessity. Individual teachers tend to capitalize on their specialties and to bolster their weaknesses through interaction with others. Within the unit, two certifiable levels (unit leader and teacher) exist, and more are possible. Each unit can accommodate a professional teacher, staff teachers, resident teachers, and interns. Finally, the incorporation of special teachers into unit operations redefines their roles in numerous ways.

In a Multiunit School all members of the instructional staff participate in instructional decisions according to their abilities. A teacher is not asked to decide matters beyond her competence, nor is she excluded from decisions in which she has an important stake.

The variety of student learning activities available in a unit has already been illustrated. To emphasize the point: a staff of four to six teachers, one or two interns, and one or more paraprofessionals working in several rooms and locations permits much greater flexibility than one teacher with 25 children in one room. This same flexibility permits individually guided learning activities and an appropriate emphasis on concept formation and application.

A common approach in the Multiunit School is to leave the scheduling of time to each unit. Units commonly use large blocks of time, rather than small modules, and often seek cross-unit cooperation by scheduling language arts, for example, at the same time to all units. Whatever the decisions, the key is that the unit can and does reschedule time frequently, and can lengthen or shorten the time any individual child gives to any subject area.

It is best if a Multiunit School has a modern and flexible facility: pods, clusters, movable partitions, multimedia rooms, an instructional resources center, and so on. Whether such a facility is present or not, the Multiunit process assures maximally efficient and effective use of its own spaces, and the Instructional Improvement Committee assures optimal use of larger spaces such as the library and gymnasium. These same conditions permit the selection and maximum utilization of major instructional equipment.

We have previously made the point that educational personnel outside the building--central office specialists, state education agency personnel, and university staff--are inefficiently and infrequently used by teachers in most traditional schools. The Multiunit approach permits their use when needed and capitalizes upon their energies by employing them with groups of teachers rather than individuals.

Finally, home-neighborhood liaison is naturally stronger in a Multiunit approach for two reasons. First, the employment of aides from the community ensures a channel of two-way communication not available in aide-less schools. Second, all information given the community about children's progress or about the instructional program is developed and designed by the joint efforts of the unit, the Instructional Improvement Committee, the system-wide policy committee, or all three.

The preceding discussion indicates the authors' position that the Multiunit approach to elementary education contains the flexibility and pools the talents necessary for the improvement of the instructional program in the directions needed in the years ahead.

For the Education of Teachers.

A widespread adoption of the Multiunit approach to elementary education has far-reaching implications for both the pre-service and in-service education of teachers. Let us examine the latter first.

At present, it is common to induct a beginning teacher by a process of the following kind. First, the beginner attends a week or less of "orientation" meetings, usually devoted to recitals of the teachers' handbook and board policy statements. Next, she may be assigned a "buddy" teacher, whom she will see only during coffee break and lunch and occasionally after school. Finally, she is assigned a class and left to her own devices, to be visited infrequently by the harried principal. It is no surprise, under such conditions, if the first-year teacher fails to achieve full professional stature by June.

In a Multiunit School, the new teacher also receives orientation and may be assigned a buddy, but at that point her induction pattern differs. She is assigned to a unit rather than an isolated class, and from the first day she works alongside more experienced teachers and under the guidance of the unit leader. The unit often employs specialists to the benefit of the whole unit including the new teacher. Frequent unit meetings and occasional in-service days, designed by the Instructional Improvement Committee, offer the new teacher much greater opportunity for growth. Formal courses and district-wide in-service programs are also available, as they are in traditional schools, but the important fact is that new-teacher growth is a function of the working situation.

Furthermore, the use of several levels of instructional roles provide incentive and reward for professional growth. The new teacher who develops well can look forward to advancement as a fully certified teacher and eventually as a unit leader. In traditional schools, advancement requires exit from the classroom. What we have said of the induction of new teachers also applies to teachers making a transition between schools of school districts, or between levels (primary, intermediate, etc.).

Widespread use of the Multiunit approach also has profound implications for the pre-service preparation of elementary teachers. An obvious advantage of the Multiunit School is that it provides an excellent setting for the guided clinical experiences of interns. Interns fit well into the unit structure, beginning their experiences with observation and limited performance and moving steadily towards full participation as a unit member. All the benefits listed above, in our discussion of the new teacher's induction, accrue to the student teacher or intern.

## For Research and Development

In recent years, public pressure for educational innovation has tended to produce an artificial and ineffective response. Schools innovate too rapidly, with naive acceptance of untested claims made for the innovations they adopt and often for the sake of being on the innovation bandwagon. The subdued professional climate of the self-contained classroom school has solidified natural human resistance to change and has also presented insurmountable barriers to systematic development-based research designed to improve instruction. The Multiunit School produces a climate in which innovations can readily be introduced and evaluated.

Self-contained classrooms prevent control of several variables which hamper valid experimentation: teacher differences, student differences, the effects of sequence of treatments, and so on. A unit has sufficient flexibility in all these respects to allow the design of excellent research. The unit leader also has time to develop new procedures independently and to work with personnel from other agencies in development activities and related testing and refinement. These conditions in the Multiunit School provide an excellent environment for development-based research initiated by the school and cooperative activities between the school and other agencies.

Basic research between the school and other agencies concerning the structure of knowledge, the nature of learning, and so on, can be carried on with relative ease in a Multiunit School. Especially important is the fact that the unit leader can make certain that experimental treatments and data collection are executed systematically. The early concern of the Wisconsin R & D Center in developing the Multiunit concept was to provide a facilitative environment for research and development. The Multiunit Schools working directly with the R & D Center provide this environment admirably. A Multiunit School in Toledo provides a similar environment for The University of Toledo. Thus the Multiunit School provides facilitative environment for research and development, whether initiated by the school personnel, district personnel, or university researchers. The unit also might serve as locale for an intern in research and development. Although the concept of research intern in a Multiunit School is not developed fully, it merits consideration.

Profound changes in elementary education lie ahead, and to facilitate these changes a new concept for organizing elementary schools is needed. The Multiunit organization is well suited to accommodate and expedite the changes which will take place.

The Context of Educational Technology. The development of educational technology, especially within recent years, has definite implications for the training of elementary teachers. The meaning of educational technology in the context of this project is very broad, from relatively simple devices to complex systems such as a computer assisted program for individualized instruction. Any model teacher education program that is expected to be functional when implemented requires provisions for the effective use of educational technology by the teacher being prepared.

Any number of devices or systems, both of the hardware and software varieties, could be discussed to illustrate the importance of educational technology as one of the contexts in which the general goals of teacher education are considered and specific behavioral objectives are developed. Instead of singling out certain important topics for discussion, such as the media center, programmed instruction, simulation, computer assisted instruction, etc., we have produced a variety of educational specifications suitable for elementary teacher education and classrooms. Some of these can probably be immediately utilized; others will be rejected or postponed. Thinking behind these specifications is to be found in the position paper which follows.

## Position Paper for the Context Educational Technology

# EDUCATIONAL TECHNOLOGY AND THE ELEMENTARY TEACHER*

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There seems to be general agreement in education today that the role of the classroom teacher is in need of redefinition. What his role should be and how he should be prepared for that role is the subject of a great deal of discussion. It is the purpose of this paper to 1) examine the present role of the elementary teacher and identify some of the major weaknesses in the present organizational system, 2) to redefine the role of the teacher with particular attention being paid to his relationship to educational technology and mediated instruction, and 3) to specify the competencies needed by elementary teachers in relation to educational technology.

## A Systematic Analysis of the Role of the Elementary Teacher

There are many forces exerting pressure on the teacher and demanding a reexamination of his effectiveness. Two of the most pressing are the growth of knowledge, i.e., the need to know more about more subjects and to grasp this knowledge from a structural point of view rather than a factual point of view, and the current focus on the individual learner and the resultant pressure to individualize instruction in order to develop each student to his fullest potential and to develop as many facets of that potential as possible. This second pressure, the individualization of instruction, is seen as a worthy goal of elementary education. Having generally achieved the goal of education for the masses, the next logical step in the improvement of public education is to individualize that education.

The role of the teacher can and has been analyzed from several different theoretical positions. The theoretical orientation used in this paper will be that of General Systems Theory as proposed by Ludwig von Bertalanffy (1) and expanded and developed by such individuals as James Miller, (2) Kenneth Boulding, (3) A. D. Hall and R. E. Fagen. (4) General Systems Theory provides a very useful conceptual framework for analyzing complex phenomenon. The concepts which show the character, actions, and properties of systems will be applied to the role of the teacher in a school setting in order to understand his present situation and to propose a new role. Further analysis of his proposed role will reveal the competencies he will need to successfully fulfill his functions. However, this analysis will be limited to an examination of needed competencies in relation to educational technology. A further limitation confines this analysis to elementary school teachers.

* The reactions of Dr. Robert Marker and Dr. Alexander Shure are incorporated into this paper.

## The School as a System

There is little doubt that a school, that is an individual school building, can be considered a functioning system since it has definable inputs (students, teachers, information, finances, goals, etc.) and outputs (educated students) and is made up of components (teaching units, facilitating units, administrative units, etc.) which operate in concert or related fashion with the purpose of accomplishing a specified goal or set of goals. (See Figure 1--Trzebiatowski)

Many systems concepts could be used to describe the behavior of the school as a system and of the teacher as a key element in that system; however, only those germane to this analysis of the role of the teacher will be included. The first two to be considered are the steady growth in volume and complexity of inputs into the school. The change in volume of input is most noticeable in three types of input. First of these is the increasing complexity of educational goals, i.e., from the 3 R's toward complete socialization of the child. The second is the exponential increase in the volume of information entering the school. The change in the student's character and normative standards, as America shifts from a rural-agricultural society to an urban, post-industrial society, seems to be more significant than the sheer increase in number, although the interactional effects of increased numbers on changing student character would be difficult to measure.

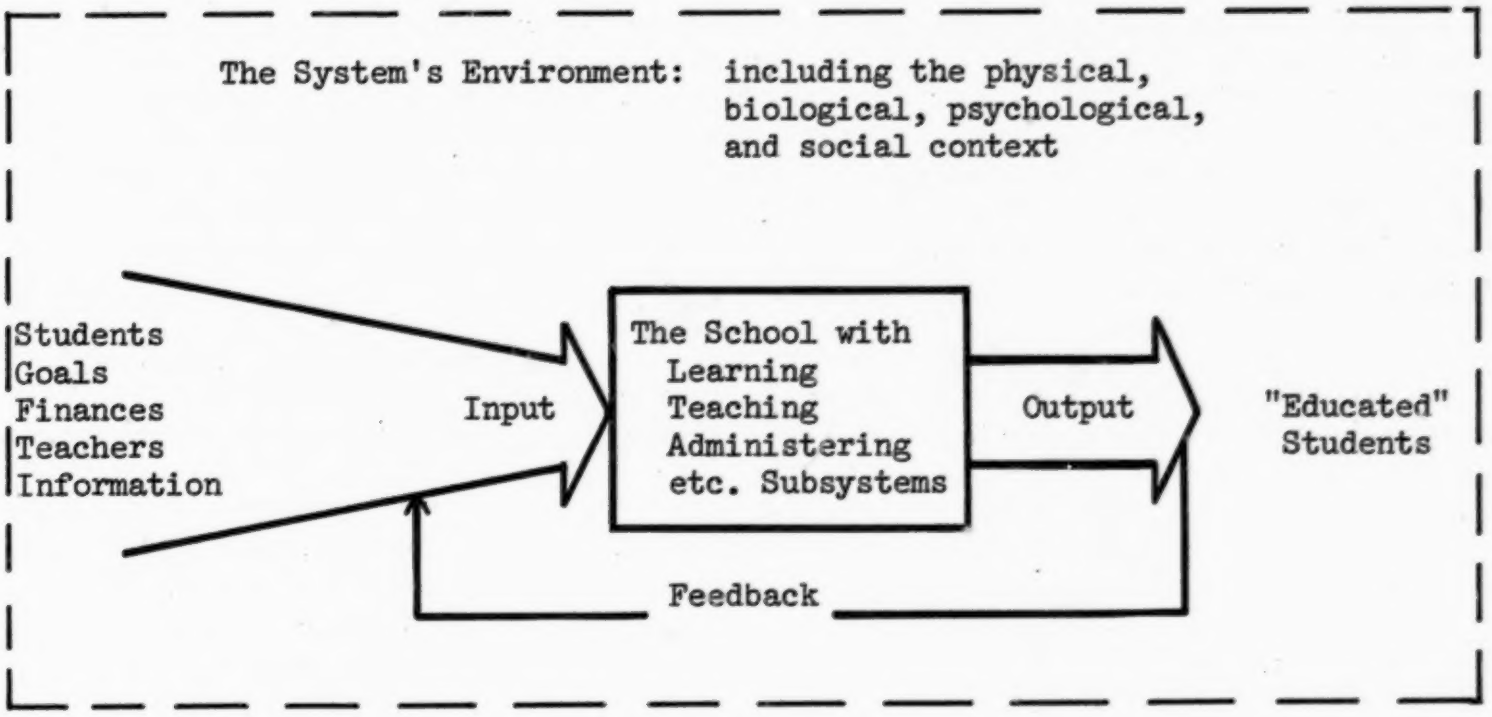
The System's Environment: including the physical, biological, psychological, and social context
Students
Goals
Finances
Teachers
Information
Input
The School with
Learning
Teaching
Administering
etc. Subsystems
Output
"Educated" Students
Feedback

Figure 1 The School as a System

The radical changes in the role of the elementary teacher can best be illustrated by considering the one room country school of Midwestern America as it existed thirty years ago. A teacher in a one room school was faced with what today seems like an incredible number of roles and tasks. For example, he was the school's superintendent since he attended the monthly Board of Education meetings, interpreted and put into action the policies they formulated. He was the school's principal by virtue of the fact that he was in charge of a building which housed eight grade levels. By determining what to teach, selecting textbooks and other instructional materials, he assumed the duties of a curriculum director. His prime function, however, was to serve as the reading, history, spelling and language, geography, social studies, arithmetic, and science teacher. This marvelous person also served as the school's guidance counselor, nurse, librarian, and audiovisual director. And he usually ended his working day by performing custodial duties.

It is not my purpose to list all of the roles and functions of the one room country school teacher, nor to invoke nostalgic admiration, but to illustrate the steadily changing role of the teacher and to point out that this role will continue to change and evolve as the demands made on the schools by society continue to change.

When a single person filled the many roles and functions of the one room school, that school, as a system, was in a state of nearly complete wholeness because the subsystems of the school were staffed by the same person. Thus the flow of information between the various subsystems was maximal, and a change in one entity of the system affected changes in other entities of the system, e.g., if the parents of the children were scheduled by the teacher to visit the school in order to be informed of their child's progress, then the school's custodian was sure to receive this information and make a special effort to clean the building since the teacher and the custodian were the same person.

Since the days of the one room school, the subsystems of the elementary school have been moving away from a state of wholeness toward a state of independence. A change in one entity of a system affects that entity only and does not affect the overall action of the system, e.g., the absence of an elementary school principal for one day does not appreciably affect the students; however, in the one room school the absence of the principal (teacher) meant closing the school.

A school can have both wholeness and independence since these properties exist in a system in varying degrees. When changes in a system move it toward wholeness it is said to be undergoing progressive systemization. The opposite of progressive systemization is progressive segregation, i.e., when changes in a system move it toward independence (See Figure 2--Trzebiatowski) Finally, when progressive segregation and progressive systemization take place simultaneously and with equal force, the system is said to be in a steady state.

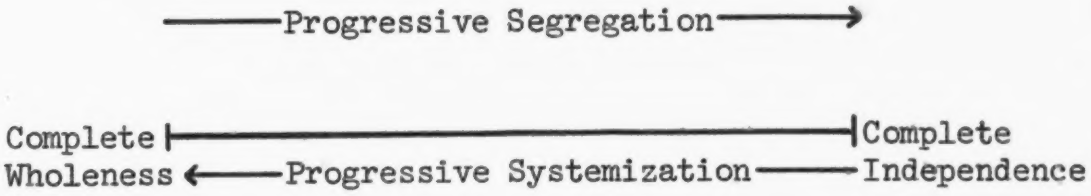

Figure 2 The Wholeness-Independence Continuum

The American elementary school has not been in a steady state for a good many years. Its components have been moving with increasing rapidity toward independence through progressive segregation. Progressive segregation has taken place in almost every facet of the elementary school. Consider as examples the segregation of pupils into grade levels, the development of an administrative hierarchy, the segregation of subject matter by grade levels and teaching by subject matter specialists, the separation of special services into a host of departments, units, [illegible] areas.

The forces pushing progressive segregation of the school and thereby increasing the independence of the subsystems are many and varied; those previously mentioned should serve well as examples at this point. These forces can be most easily identified by studying the changes in input of the school as a system. Increases in the number of students seem to have forced the segregation of students into grade levels with each grade being taught by a different teacher. As the goals of the society which the school served changed, more importance was placed on the development of each individual student, more specialists were added to faculties to meet the special needs of a student or students, e.g., guidance counselors were added to fill the need for student counseling. The trend in school organization seems to be unmistakably in the direction of independence through progressive segregation of the school's subsystems since the amount and complexity of the school's input will continue to increase. In fact, an ever increasing amount of specialization and separation of functions seems essential if the educational system is to cope with the increase in inputs.

The reader may be wondering what is so important about the subsystems of the school moving toward a state of independence if that state was reached as a fairly natural reaction to increased input. The point to be made here is that, according to General Systems Theory, a system which is 100% independent or totally lacking in wholeness is a degenerate system, that is, a system which fails to produce an output. A careful examination of the dropout statistics should supply ample quantitative evidence that to a significant portion of our student population the school system is a degenerate system.

## The Teacher as a Filter

In a healthy system the force which holds a system in a steady state, which counteracts progressive segregation or moves the system toward a greater degree of wholeness, is called progressive systemization. Unfortunately in our elementary schools as they are presently organized, when specialists are added due to normal growth of the system, progressive segregation takes place without the counteracting effects of progressive systemization, thus making the efforts of the specialists less effective because they are progressively farther removed from contact with the learner. The specialist, whose role was created to improve the efficiency and effectiveness of the teaching-learning process, tends to be removed from contact with the learner both physically and bureaucratically.

One of the factors which seems to be blocking progressive systemization is the self-contained classroom and the teacher in charge of it. The teacher acts as a very efficient filter, filtering or blocking the efforts of a great many specialists to improve instruction. As long as the teacher acts as a filter, stopping or altering the flow of information from education specialists to the learner, progressive systemization is effectively stymied. Here are just a few examples of information generated by specialists that can be and often is filtered by the self-contained classroom teacher:

1. Curriculum innovations
2. Research findings
3. Information about new instructional strategies, such as programmed instruction
4. Diagnostic test results
5. Changes in subject matter content.

It is not surprising that a teacher filters or chooses to ignore, often unconsciously, a large portion of the information passed on to him. Like any other communications channel, his channel capacity is limited; the input is simply too great for one individual to handle, no matter how conscientious the individual.

## The Input Overload on the Teacher

Let's look at the information load the self-contained classroom teacher is asked to handle. It's easiest to illustrate if one can imagine the pre-service teacher going from specialist to specialist learning about the various bodies of knowledge which can be brought to bear on the teaching-learning process.

In each of a half dozen different subject matter areas, the elementary teacher is sternly told that a superficial knowledge of this particular field is not sufficient to gain even a basic understanding of the materials being studied and that further study in this rapidly changing field is essential. In curriculum courses the young teacher learns about the many new curricular approaches which are being developed, e. g., the process approach, teaching by discovery, etc. The course in the teaching of reading introduces him to the perennial whole word versus the phonetic approach plus a number of new approaches, including the initial teaching alphabet and various color coding systems. The reading course ends like almost all of the others by strongly encouraging the teacher to read and keep up with the research on the effectiveness of current methods and to be open and willing to try new, but as yet undeveloped, methods.

In a course on the effective utilization of instructional materials, the teacher is made aware of the importance of being familiar with all the instructional materials--i.e., films, filmstrips, maps, globes, study prints, charts, graphs, bulletin boards, overhead transparencies, programmed materials,--that are available for his grade level and subject or subjects so that he can order, preview, select, and finally utilize the most effective teaching materials available. The teacher must also be capable of operating and maintaining at a minimum level the associated equipment. And if he can't locate the instructional materials which meet his particular needs, he must find the time and possess the necessary skills to produce materials that are tailor-made to meet the needs of his particular group. Is it any wonder that teachers resort to lecturing when even the instructional materials specialists must struggle to keep up with the latest materials being made available?

In educational psychology and sociology courses the teacher is told to become thoroughly familiar with the internal thought processes of the child and to study carefully the social and cultural environment in which the child lives. It should be noted that special courses for those teachers who will be teaching culturally disadvantaged children are currently being added to the teacher's curriculum.

In courses dealing with measurement and evaluation, the teacher is impressed with the importance of carrying on a conscientious program of evaluation in order to avoid the tyranny of testing and still be capable of scientifically assessing pupil progress. In the research methodology course he is told that a really "good" teacher carries on an active program of inquiry and experimental research, preferably in conjunction with a college or university.

In a guidance and counseling course the teacher is asked to keep careful anecdotal records on each pupil in order to maintain from grade level to grade level and from teacher to teacher, an active file on the personal development of each child and to have an accurate record for the school psychologist, should his services ever be needed.

Any single set of the specialized demands mentioned above does not require the teacher to process an excessive amount of information, but, taken as a whole, these demands are impossible to fulfill. As a result of the overload of input the teacher is faced with two choices. He can process those inputs which he feels are most important to the completion of the immediate task or he may attend to inputs which he feels are relatively unimportant but which he is forced to handle. For example, when the teacher begins teaching in the fall, he is flooded with an avalanche of disciplinary, supervisory and administrative tasks. This is one type of input he can not afford to ignore, since promotion and tenure weigh heavily upon how well he performs these administrative duties. Anecdotal records can be ignored, but attendance records, report cards, and milk money must not.

Almost all of the various informational inputs which the teacher is presently being asked to assimilate are essential; few, if any, can be eliminated. In fact, if the present goal to truly individualize instruction is to be achieved, even more information will be necessary. However the present organizational structure is not capable of handling even the present level of information input. As long as the self-contained classroom teacher remains the final instructional decision-maker, much of the information made available by educational specialists for instructional decision making will continue to be left unutilized. Increasing the pressure on the teacher will only increase the strain on an already overloaded communication system.

The following section will propose an alternative organizational pattern which will recast the role of the teacher, permitting specialists to directly influence instructional decision making and to take advantage of the educational technology which will play a key role in the teaching-learning process of tomorrow.

## A New Role for the Elementary Teacher

Simply stated, the prime functions of the teacher are the transmission of knowledge and the transmission of values. As previously mentioned, both cognitive knowledge and societal values and norms are becoming increasingly complex. When attempting to fulfill his task as a transmitter of values and norms, the teacher must not only mediate between the child's world and the adult world in an effort to close the ever widening generation gap, but he must also deal with a serious cultural gap. The cultural gap is especially important when the student's cultural background is markedly different from the teacher's. When norms are in a state of flux, as in our attitudes towards sex and drugs, the teacher may not feel competent to force his values upon the pupils. When the teacher attempts to fulfill his function as a transmitter of knowledge, he is again caught in the web of rapid change. It seems clear that if the teacher is to fulfill these two functions successfully, he will need help.

### The Teacher as a Team Member

If the elementary teacher is to maximize his effectiveness in the transmission of cognitive knowledge, he will need to be a member of a team--a team made up of specialists. The purpose of the team would be to design instructional systems. An instructional system is a strategic complex of human and nonhuman components which are dynamically interdependent and interrelated and work together to attain a particular instructional goal or set of goals. The instructional system receives inputs from the external environment, processes these inputs in a prescribed instructional environment according to strategies derived from research and expert opinion, so that the output generated will have a high probability of achieving the prescribed goal or goals. The instructional system components may include some or all of the following: learner (s), teacher (s), mediated instructional materials, assessment and feedback instruments, information processing and displaying machines, support technician (s).

The key to this arrangement is the team. Instructional decisions are made cooperatively by a team of specialists with a master teacher serving in the role of instructional specialist throughout the entire instructional system design process. Each team could serve a number of master teachers. For example, in a building of thirty teachers and nine hundred pupils there could be six master teachers all of whom were served by the same Instructional

System Design team. (See Figure 3--Trzebiatowski)

The membership of the ISD team would vary depending upon the needs and background of the pupils, e.g., a slum school would probably need the services of at least one sociologist or an elementary school near Cape Kennedy might require a specialist in space technology in order to take advantage of the children's knowledge of space science which they learned at home. Some of the specialists that would very likely serve on all instructional system design teams would be:

| | | |
|---|---|---|
| 1. | Subject matter specialist | To update the subject matter. |
| 2. | Curriculum specialist | To determine the mix of what to teach to whom. |
| 3. | Research specialist | To evaluate the instructional systems efficiency in terms of the output produced and to collect and feed back data needed to redesign the system; to calculate cost/effectiveness estimates of alternative instructional strategies and systems. |
| 4. | Educational sociologist | To interpret the social and cultural milieu of the child. |
| 5. | Educational psychologist | To study the child's growth and development and his individual learning patterns. |
| 6. | Instructional technologist | To design, develop, and test modules of mediated instruction. |
| 7. | Administrative specialist | To meet the administrative and managerial needs of the team. |
| 8. | Information Management Specialist | To develop information storage and retrieval systems, computer based information management system, and computer simulation techniques. |
| 9. | Counseling and guidance specialist | To fill the guidance and counseling needs of the students through and with the help of the teachers. |
| 10. | Pupil evaluation specialist | To specify in behavioral terms the goals for each pupil, to assess the progress of each individual pupil and to make recommendations to the ISD team for modifications of the pupil's program. |

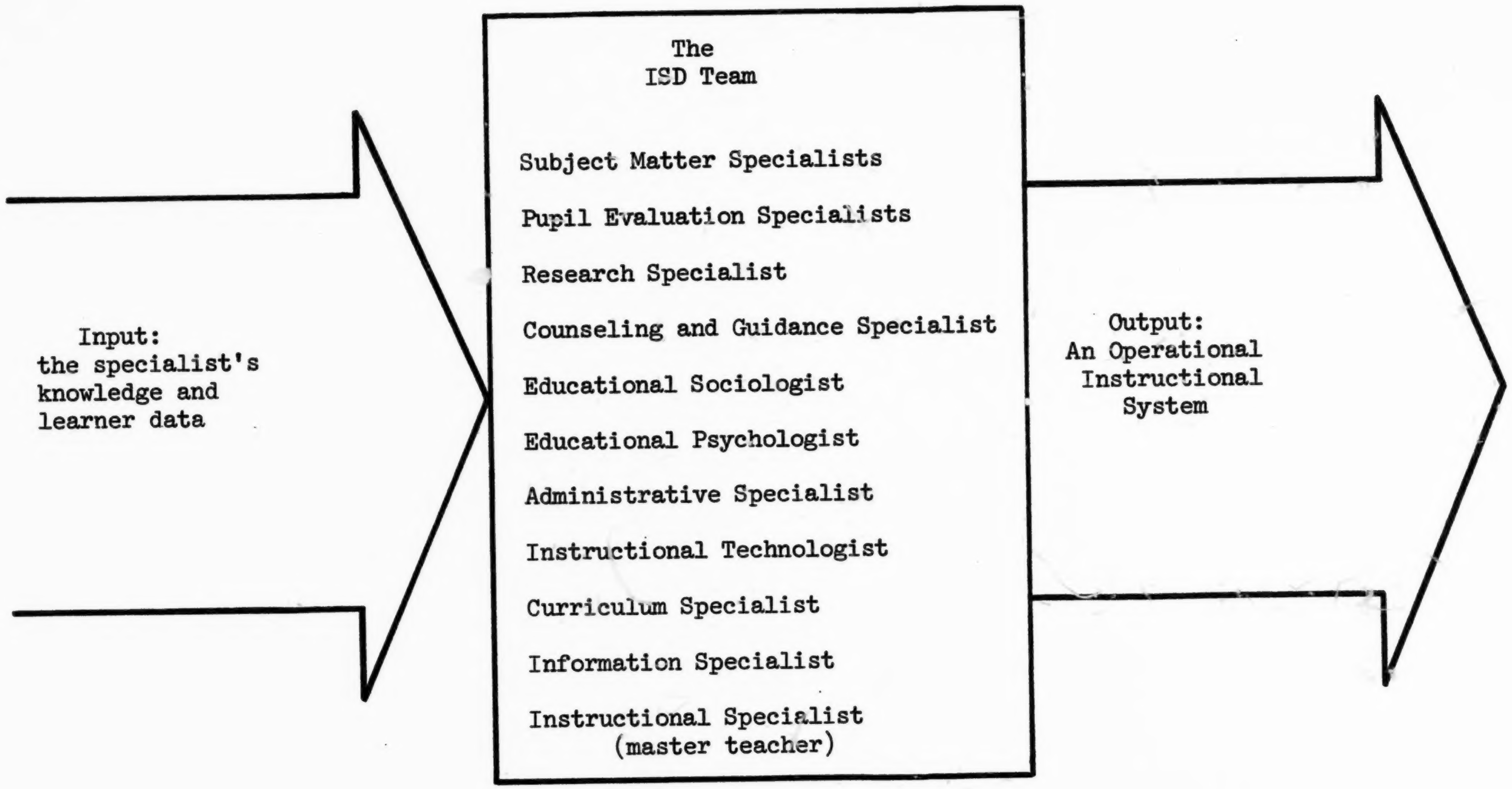
Input:
the specialist's
knowledge and
learner data
The
ISD Team
Subject Matter Specialists
Pupil Evaluation Specialists
Research Specialist
Counseling and Guidance Specialist
Educational Sociologist
Educational Psychologist
Administrative Specialist
Instructional Technologist
Curriculum Specialist
Information Specialist
Instructional Specialist
(master teacher)
Output:
An Operational
Instructional
System

Figure 3 The Instructional System Design Team

| | |
|---|---|
| 11. Instructional specialist | To bring instructional theories and strategies to bear on the instructional process and to lead the IS implementation team. |

Each specialist would be supported by a cadre of support staff, e.g., the administrative specialist would have appropriate clerical, secretarial, and data processing equipment and personnel, etc. to help him carry out his functions, the educational technologist would have a support staff of media specialists, i.e., instructional television specialists, programed instruction specialists, graphic arts specialists, technicians, mediated teachers, so that he could fulfill his task of designing and producing modules of mediated instructions. Some members of the support staff would serve at the building level; others would serve a group of schools or the entire district, depending upon the demand for their services.

Each of the team specialists, including the instructional specialists, would have ties to an appropriate agency which would keep the specialist up-to-date through regularly planned continuing education activities. Experts from these agencies could be called upon to bring information and techniques to bear upon problems which the ISD team was not able to solve satisfactorily. The movement of experts into and out of the ISD team would tend to keep it vital, growing, and changing to meet new needs as they develop. For example, an expert might recommend that a new specialist be permanently added to the team in order to fully represent a new area of concern, e.g., subject matter specialist representing computer programming becomes a permanent member of the subject matter specialist staff, or an M. D. might be added to the team to administer "learning" drugs to children.

The instructional specialist is considered to be a key individual on the ISD team. This individual is likely to be a fully committed career teacher who sees his professional role not merely as a dispenser of knowledge, but as someone who is familiar with the strategies of instruction which maximize learning. He sees himself as the director of learning and the manager of the learning environment, as an instructional analyst who can analyze and diagnose learning problems, as someone who is in the process of learning and developing his skills through research and study, and, finally, as someone who can serve as both a team member and a team leader.

## The Teacher as a Team Leader

The role of the teacher as a team member, i.e., as an instructional specialist serving on an instructional system design team, was discussed above. We shall now turn to the teacher's role as a team leader. In order to put the instructional system designed by the ISD team into practice, the instructional specialist must serve as a team leader in the role of a master teacher. The implementation team might simply be called the Instructional Team with the instructional specialist as its leader (see Figure 4--Trzebiatowski). Such a team would be made up of the following:

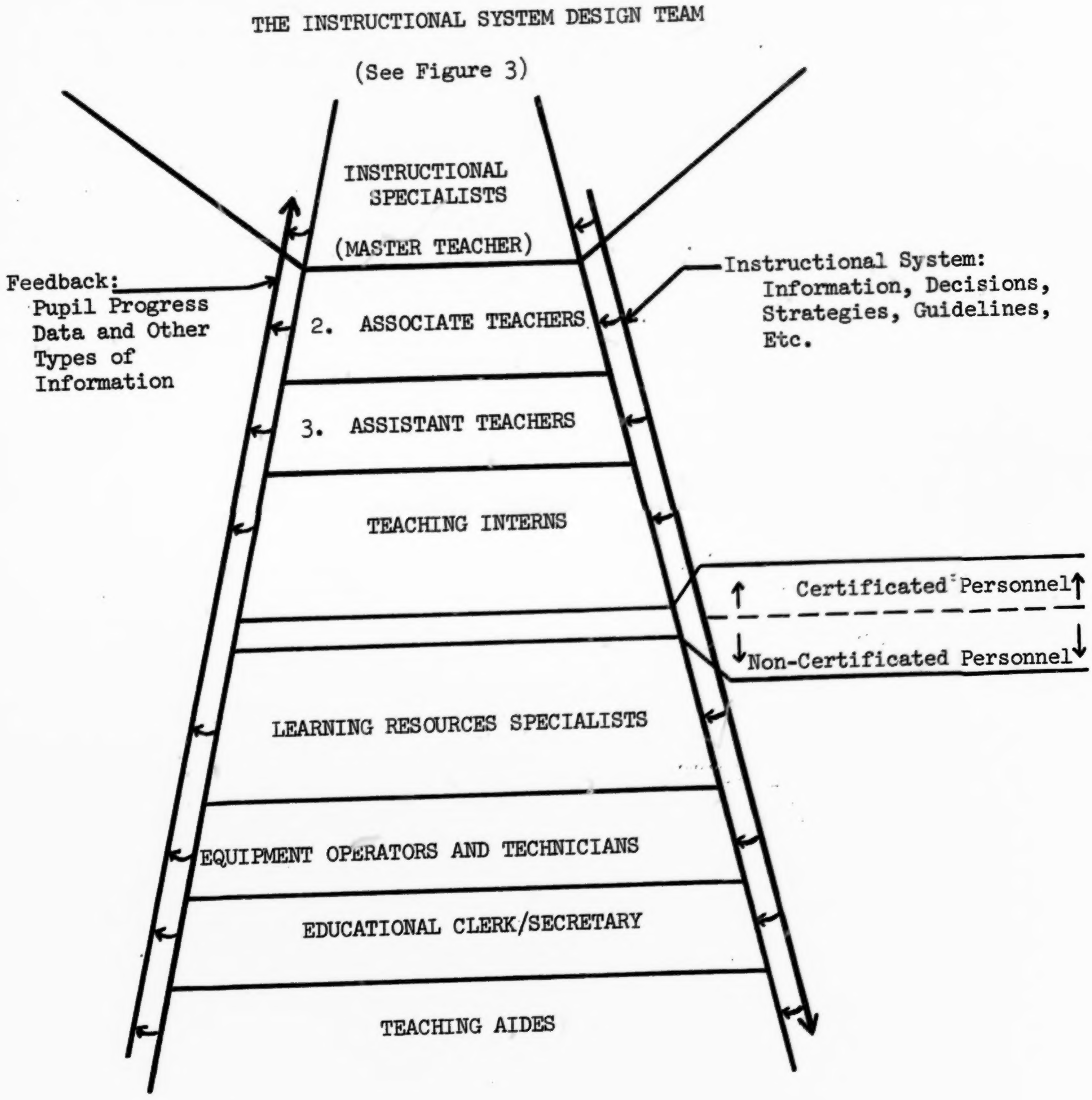
THE INSTRUCTIONAL SYSTEM DESIGN TEAM
(See Figure 3)
INSTRUCTIONAL SPECIALISTS
(MASTER TEACHER)
Feedback: Pupil Progress Data and Other Types of Information
2. ASSOCIATE TEACHERS
Instructional System: Information, Decisions, Strategies, Guidelines, Etc.
3. ASSISTANT TEACHERS
TEACHING INTERNS
↑ Certificated Personnel↑
↓Non-Certificated Personnel↓
LEARNING RESOURCES SPECIALISTS
EQUIPMENT OPERATORS AND TECHNICIANS
EDUCATIONAL CLERK/SECRETARY
TEACHING AIDES

Figure 4 The Instructional Team

| | Member | Function |
|---|---|---|
| 1. | Instructional specialist (master teacher) | To direct the activities of the instructional team members as they implement the instructional system; to serve as the prime feedback agent for the ISD team. |
| 2. | Associate teacher | To serve as team members and to direct the activities of any subunits which might be specified. |
| 3. | Assistant teacher | To implement the instructional system. |
| 4. | Intern teacher | To assist the other teachers and to learn through direct involvement the competencies needed to become an assistant teacher. |
| 5. | Learning resource specialist | To serve as a resource agent for the team's teachers and pupils: to identify, collect, store and/or produce stimulus learning materials to meet specific needs of the teachers and pupils. |
| 6. | Equipment operator and technician | To set up and operate learning equipment; to do simple maintenance and repair of equipment; to set up or arrange the learning environment according to the specifications of the instructional system. |
| 7. | Educational clerk/secretary | To handle the clerical and secretarial demands of the instructional unit. |
| 8. | Teaching aide | To assist the teachers in implementing the instructional system. |

The differentiated staffing pattern which is proposed for the instructional team is not unlike those proposed by Dwight Allen, (5) L. O. Andrews, (6), The Temple City (California) Differentiated Staffing Project, (7) and others. It is unique in that this proposal places instructional decision making at a strategy level one step above the implementation level and into the hands of a team of specialists.

The input overload on the self-contained classroom teacher was cited as one reason for moving to a team planning approach. However, several other secondary reasons should also be mentioned. The turnover rate of beginning teachers should be carefully examined. It is estimated that one-third of the teachers trained in the United States never begin teaching and that another third leave teaching after one to three years. This high attrition rate should not only be cut down but arrangements should be made to relieve the inexperienced teacher of the stress which accompanies the first several years of teaching. A differentiated staffing pattern coupled with an instructional system design team would effectively relieve the inexperienced and partially committed teacher of many crucial responsibilities and pressures. A differentiated team staffing pattern would also greatly facilitate inservice and continuing service training. Each team should be overstaffed on the assumption that at least one member would be absent at all times because of their involvement in continuing education programs constantly being conducted by the school district and/or a college or university, or by some other appropriate agency.

Another reason for adopting the instructional system design approach to instructional planning is the need for careful coordination of classroom teachers and mediated teachers. Mediated teachers are those who do their teaching through various instructional technologies, e.g., the instructional television teacher, the film teacher, and those who prepare self-instructional materials such as programed learning materials. If mediated instruction is to move out of the "teaching aid" category and into a full teaching partnership with classroom teachers, then a higher level of planning and control seems necessary.

Other instructional strategies, such as team teaching, which do not necessarily involve mediated teachers also require careful planning and coordination if they are to be effective. Many of the new instructional innovations fail because insufficient planning time is provided; thus, teachers involved feel threatened and unsure of their role in relation to the innovation. Teachers of the future will not have the option of accepting or rejecting mediated teachers, curriculum innovations, etc. Anaheim, California, teachers, for example, are told before they are hired that they will use instructional television in their classroom. When the role of the classroom teacher is clearly defined, even though it is significantly different from the traditional role, teacher acceptance follows. One of the role changes will be that the classroom teacher is no longer the prime transmitter of information to the students; this will be a shared responsibility. If the classroom teacher is relieved of much of his "teaching" responsibility, he can devote a much greater portion of his time to managing the learning environment, to motivating pupils, to guiding individual pupils through various learning experiences, to diagnosing learning problems, and to becoming a truly significant other in the lives of each pupil.

If educational technology is to replace the classroom teacher as the prime teaching agent in an instructional system, then a careful examination of the whole concept of educational technology would seem to be in order. The following section of this report will attempt to define educational technology through a discussion of the key terms involved. The final section will then define the relationship of the classroom teacher to educational technology and describe the competencies that a teacher will need to successfully take advantage of the technology which will be available.

## What is Educational Technology?

The key word in the above question is technology. Once understanding and agreement can be reached on this term the question is relatively easy. Many persons find the term technology difficult to understand. To many technology means machines. While machines are an indispensible part of technology, they are only an outward, visible manifestation of a process, a process which is so ingrained in our society as to be almost invisible. John Kenneth Galbraith, the very articulate and widely read economist, does not mention machines when he states, "Technology means the systematic application of scientific or other organized knowledge to practical tasks. Its most important consequence, at least for purposes of economics, is in forcing the division and subdivision of any such task into its component parts. Thus, and only thus, can organized knowledge be brought to bear on performance." (8) In a footnote, Galbraith carefully separates technology from mechanical processes: "However, the subdivision of tasks to accord with areas of organized knowledge is not confined to, nor has it any special relevance to mechanical processes. It occurs in medicine, business management, building design, child and dog rearing and every other problem that involves an agglomerate of scientific knowledge." (9)

If we take Galbraith's definition and cast it into an educational setting, educational technology then becomes the systematic application of verified educational knowledge or other organized bodies of information to the accomplishment of specific and measurable educational goals. It is the thesis here that educational problems are too complex and the specialized bodies of knowledge which make up the discipline of education are too complex to be applied by a single person--namely the classroom teacher. The ramifications of the input overload on the classroom teacher were discussed above in the section on the teacher as a filter. It was for this reason that the instructional system design team was proposed, so that a team of specialists could take their specialized bodies of knowledge and systematically apply them to instructional tasks.

As Galbraith points out, the application of technology to a given task forces the division and subdivision of the task into its component parts. When an instructional system is designed just such a division and subdivision of the instructional tasks takes place. And with the wide scope of knowledge represented by the specialists on the instructional system design team, all variables pertinent to the instructional tasks should be considered when the operational details of the instructional system are prescribed; the very best solution possible should be formulated.

Implied in any definition of technology is the thesis that man is not a beast of burden to be valued for his physical strength; he is to be valued for the characteristic that makes him most human--his ingenuity. In practical terms this thesis means that whenever possible machines and other labor saving techniques will be used to replace human effort in order to release the human so he can use his energies for other creative advances. Educators have not organized themselves very well in order to apply organized knowledge systematically to the solution of their tasks; nor have they been committed to the thesis that machines and other labor saving techniques should be applied to instruction in order to release the teacher for more creative work. The classroom teacher is still looked upon by most educators as the coolie in the instructional rice paddy.

If technology is to be successfully employed in education then there must be a commitment to the technological process, i.e., a commitment to systematically apply all relevant knowledge and techniques to the solution of a problem by first analyzing the components of the problem and then synthesizing them into a unique solution. These solutions will very likely involve man-machine systems. Traditionally, the machines that have been used in education have been referred to as educational media. Charles F. Hoban clearly separates the hardware of education--educational media--from educational technology when he warns that ". . . the term educational media does not, in itself, suggest the ramifications for research and for educational policy and operating procedures which are inherent in the term, technology of education. Technology is not just machines and men. It is a complex, integrated organization of men and machines, of ideas, of procedures, and of management. The introduction of this complex organization generates many systematic problems that can be and have been ignored or generally neglected in theory, research and practice in education. The term, 'educational media' limits, and the term, 'educational technology,' expands the areas of theoretical development, research and implementation in education." (10)

Educational technology broadly conceived involves a commitment to a process which utilizes the best scientific knowledge and techniques available to reduce human effort and produce a superior product with the least expenditure of time and money. But what are the bodies of organized knowledge needed to solve instructional problems at the elementary school level and what is the role of the elementary teacher in relation to them? The instructional system design team proposed above names a series of specialists who will cooperatively design the instructional systems. Each of these specialists named represents a body of knowledge which can contribute to the specification of optimum instructional strategies, however, it is assumed that the other position papers in this series will place these bodies of knowledge in the elementary school context. The four other papers will deal with instructional organization, contemporary learning/teaching processes, societal factors, and research. The relationship of the instructional technologist and the teacher will not be clarified by the other papers since such a definition falls within the domain of this paper.

## The Teacher and Instructional Technology

Instructional technology is defined here in much the same sense that educational technology was defined above. Instructional technology means the systematic application of organized bodies of knowledge to specific instructional tasks, particularly those which can be successfully completed through the use of mediated instruction. Instructional technology is a subset of educational technology just as programed instruction is a subset of instructional technology. Instructional technology is comprised of a number of areas or strategies for mediating instruction, each with its own body of information, some of which are well researched while others are supported primarily by expert opinion which has developed through extensive practical experience. Two levels or groups of knowledge can be identified; these are the extensive bodies of knowledge that (1) exist in support of the various instructional media, e.g., instructional television, films, programed instruction, graphic materials, computer assisted instruction, audio recordings, etc., and (2) the growing body of knowledge used to analyze instructional goals and to select a particular strategy or combination of mediated instructional strategies which will have the highest probability of successfully achieving the instructional goal.

Each instructional medium, e.g., instructional television, has a body of literature on program design, production techniques, logistics and utilization techniques, technical standards, and researched variables. Programed learning, instruction film, and educational television have undergone extensive research and development. The research and development activities are constantly shifting and changing; for example, computer assisted instruction, a branch of programed learning, is currently experiencing heavy development, and the relatively old medium of film is also currently being redeveloped in a single concept format for utilization with small groups or for independent study.

The second major body of knowledge deals with the analysis, synthesis and implementation of mediated instructional systems. It is made up of four rather distinct areas of study: systems analysis, communication and perception theory, learning theory, and instructional management (see Figure 5--Trzebiatowski). Systems analysis contributes a large body of information and techniques which were originally developed for use in designing industrial and military training systems. They have since been adapted for application in education through the efforts of such men as Silvern (11) and Ryans. (12) Some of the key system analysis concepts are: analysis, anasynthesis, synthesis, flowcharting, modeling, simulation, and functional objectives. Communication and perception theory provide a very useful conceptual framework within which the communication and perception problems of the learner are studied. These problems are important concerns in any instructional situation, but it is especially important that they be eliminated during the design and testing of mediated materials, particularly self-instructional mediated materials such as audio-tutorial lessons. Fortunately, when communication and perception concepts, models and paradigms are applied to problems in this area by a competent analyst, they are quite readily solved. A great many scholars have contributed to the development of communication and perception theories. The works edited by Norberg (13) and Ball and Byrnes (14) successfully collect the writings most applicable to instructional communication problems.

The direct application of learning theory to the design of mediated instruction has received a great deal of attention recently from learning psychologists and educators. Leslie Briggs and others (15) have devised a procedure for choosing media for instruction. A key step in this procedure is to identify each type of learning involved. The types of learning were identified by Robert M. Gagne and were reported in Conditions of Learning. (16) Other approaches to this area have been tried, for example Smith and Smith (17) have developed cybernetic principles of learning for application to educational design.

Interest in instructional management techniques will increase as the man-machine systems used in education become more complex. Charles Hoban (18) has pointed out the potential benefits of using operations research techniques to coordinate these systems. Heinich (19) has developed a paradigm for selecting instructional materials at the curriculum planning level.

All of the bodies of knowledge related to the design, production, and utilization of mediated instructional systems will continue to grow and exert

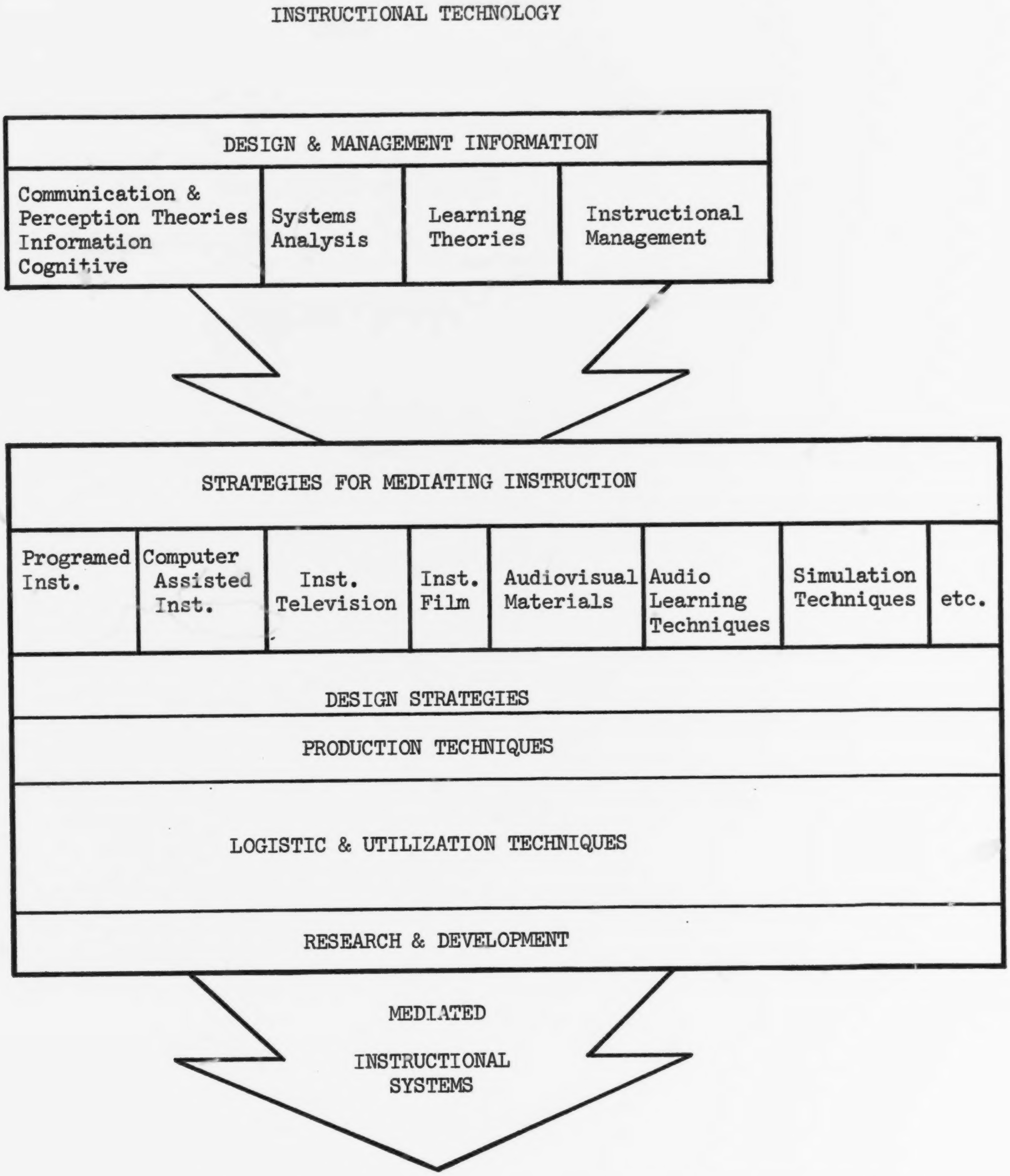
INSTRUCTIONAL TECHNOLOGY
DESIGN & MANAGEMENT INFORMATION
Communication & Perception Theories Information Cognitive
Systems Analysis
Learning Theories
Instructional Management
STRATEGIES FOR MEDIATING INSTRUCTION
Programed Inst.
Computer Assisted Inst.
Inst. Television
Inst. Film
Audiovisual Materials
Audio Learning Techniques
Simulation Techniques
etc.
DESIGN STRATEGIES
PRODUCTION TECHNIQUES
LOGISTIC & UTILIZATION TECHNIQUES
RESEARCH & DEVELOPMENT
MEDIATED INSTRUCTIONAL SYSTEMS

Figure 5 The Bodies of Knowledge Utilized in Designing Mediated Instructional Systems

greater influence on the instructional process; but what, if any, of this information will the teachers participating in an instructional team need in order to make an instructional system operational?

Even though the ISD team will relieve the classroom teacher of the responsibility for collection and processing data needed to prescribe instructional strategies and mediated teachers will share the teaching responsibilities, several very important roles remain for the classroom teacher. Teachers at all levels on the instructional team will have responsiblities for the implementation of the instructional system. A teacher's responsibility for managing the learner's environment will vary from intern up to the master teacher level. The medical profession provides a reasonably close analogy. A team of medical specialists may review a patient's case and decide that surgery holds the highest probability of recovery for the patient. Even though the decision to operate was made by a team that performs the operation. The same is true in this case since the success or failure of the instructional system rests squarely with the team of teachers that implement it; therefore, all teachers should be skilled in implementation of instructional systems. The variation in instructional strategy will be great. The instructional system may call for a teacher to lecture to a group of five hundred students in one case or to administer a completely self instructional course.

Closely related to the teachers skill as a manager of the learning environment is the ability to identify the strengths and weaknesses of the instructional system and to feed back this information, in meaningful terms, to the ISD team. This diagnostic and feedback function is a very necessary part of any system.

Another important role to be performed by the classroom teacher is the modification of commercially produced packages of materials to meet the needs of an individual or small group of learners. Commercial materials must be designed for use by as broad a group of pupils as possible in order to recover the development investment and still show a profit.

A role related to the modification and production of conventional instructional materials, i.e., conventional in the sense that they are designed to be used as classroom teacher instructional "aids" but distinctly different is mediated teaching. Mediated teaching is very different from live classroom teaching as anyone who has tried teaching by instructional television or has written a programed text can readily testify. Teachers who have an aptitude for this type of teaching will be needed in increasingly large numbers as the need for mediated instructional modules increases. The use of a great many unit length mediated instructional modules is visualized as being appropriate for the elementary school.

## Teacher Competencies and Instructional Technology

In order to fulfill the roles outlined above, teachers will need to have certain competencies and exhibit appropriate role behaviors. Analyzing these roles and identifying the required competencies is an exhausting task; both time and space prohibit the completion of this task for inclusion here. Fortunately, Dean Wesley C. Meierhenry, Assistant Dean of the Teachers College, University of Nebraska, has just completed a year long study entitled, "Media

Competencies for Teachers: A Project to Identify Competencies Needed by Teachers in the Use of Newer Media and Various Approaches to Achieving Them." (21) This study is the latest in a series of studies made by various individuals over the past forty years. While the Meierhenry study does not identify exactly the same roles for the teacher which are identified here, most of the competencies listed are ones which will be required by teachers filling the roles proposed here. Particularly applicable are the theoretical competencies identified in the paper by Norberg, the production competencies identified by Kemp, and those general competencies identified by Torkelson.

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**The Context of the Contemporary Learning-Teaching Process.** There is considerable discussion and controversy in the current educational literature about learning theories, the teaching process, the relationship between theories of learning and theories of teaching on both the conceptual and operational levels. Scandura[14] has presented a case for theories of teaching being at least to some extent independent of theories of learning. Ausubel[15] has taken a somewhat different position on this matter. The development of behavioral objectives and educational specifications does not really demand a review of various positions so much as a recognition of the importance of this component in the process of developing model teacher education program(s).

The adoption of the flexible R & I units type of instructional organization has not dictated any one position relative to learning and teaching. Similarly, the new educational technology is involved in teacher education regardless of the theoretical construct, although technology does have implications for classroom activities. It is not necessary to adopt a fixed position on the relationship between theories of learning and teaching to generate educational specifications. However, it has been mandatory to consider the context of the contemporary learning-teaching process both in terms of theoretical and tangible factors that make up this process. The use of the term "contemporary" does not mean that factors such as classical learning theories have been excluded from consideration. Any factors having definite implications for the education of the teacher involved in the present and future schools of our society have been considered.

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## Position Paper for the Context of Contemporary Learning-Teaching Process

# CONTEMPORARY FORMULATIONS OF THE LEARNING-TEACHING PROCESS

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This position paper on contemporary formulations of the learning-teaching process is prepared for the State Universities of Ohio Consortium Project to Develop Educational Specifications for a Comprehensive Teacher Education Program. It is one of four such papers, the others being intended to deal with educational technology, instructional organization, research, and societal factors, respectively. These papers will be used by the project staff as a guide in the preparation of behavioral objectives for the program. According to the invitation: "What is needed is an analysis of the relevance of the most authoritative and current information about the contemporary learning-teaching process to the ten goals stated in the proposal. The analysis should point out how the interaction of what is known about the contemporary learning-teaching process with the goals should condition subsequent efforts to prepare behavioral objectives for a program of teacher education" (1).

In short, the present paper is intended to provide one of five kinds of context in which to move from goals of elementary teacher education to teacher behaviors. The goals for the teacher education program are to prepare teachers to employ behaviors which will help every child acquire: (1) the greatest possible understanding of himself and an appreciation of his worthiness as a member of society, (2) understanding and appreciation of persons belonging to social, cultural, and ethnic groups different from his own, (3) mastery of the basic skills in the use of words and numbers to the fullest extent possible for him, (4) a positive attitude toward school and toward the learning process, (5) the habits and attitudes associated with responsible citizenship, (6) good health habits and an understanding of the conditions necessary for the maintenance of physical and emotional well-being, (7) creativity in one or more fields of endeavor, (8) an understanding of the opportunities open to him for preparing himself for a productive life and the ability to take full advantage of these opportunities, (9) an understanding and appreciation of human achievement in the natural sciences, the humanities, and the arts, to the extent possible for him, and (10) preparation for a world of rapid change and unforeseeable demands in which continuing education throughout his adult life should be a normal expectation.

Now, the major question is what are the "teacher behaviors which will help every child" achieve these goals? It may be helpful to begin by classifying these goals. Some of the goals represent kinds of outcomes that can best be achieved by one kind of teaching-learning process, while others seem to be attainable more through some other process. Is it possible to group the goals along lines relevant to different kinds of process? First, consider the goals of (a) understanding of himself and appreciation of his worthiness, (b) understanding and appreciation of persons belonging to social, cultural, and ethnic groups different from his own, (c) habits and attitudes associated with responsible citizenship, and (d) a positive attitude toward school and toward the learning process. These goals can perhaps be grouped together as goals that are involved with attitudes and interpersonal perceptions, feelings and emotions, and social values; perhaps they might be labeled affective-social goals.

Next, consider the goals of helping children acquire (a) mastery of the basic skills in the use of words and numbers, (b) understanding and appreciation of human achievement in the natural sciences, the humanities, and the arts, (c) preparation for a world of rapid change and unforeseeable demands in which continuing education throughout adult life should be a normal expectation, (d) an understanding of the conditions necessary for the maintenance of physical and emotional well-being, and (e) understanding life. These goals may be termed cognitive, inasmuch as they refer to kinds of knowledge, intellectual skill, and understanding.

Now the point of this distinction between affective-social goals, on the one hand, and cognitive goals, on the other, is that they seem to entail fairly distinguishable types of teaching-learning process.

Any one of these kinds of goals is, of course, so complex that it entails all kinds of teaching-learning process, both cognitive and affective-social processes. So any distinction between goals and corresponding processes might be arbitrary and invalid in some degree. Nonetheless, because some kinds of goals of learning seem to entail some kinds of learning process and corresponding teaching processes in greater degree than do others, some kinds of analysis and distinction-making, of the kind offered above, seem to have value.

## Types or Families of Learning Theory

Theories of learning or families of such theories have been classified in many ways. Of these, perhaps the most prominent are conditioning theories and cognitive theories. Almost as prominent as these is the social-learning theory of identification and imitation.

### Conditioning Theories

Conditioning theory is concerned with the way in which relationships between stimuli and responses are learned. In so-called classical conditioning theory, new stimuli acquire the power to elicit already available responses by being made to occur just prior to other stimuli which already have the power to elicit these responses on the basis of innate reflexes or previous learning. This is the kind of conditioning that Pavlov's dogs exhibited when, by presenting a bell ring just prior to introduction of food powder into the dog's mouth, experimental use of the bell became a conditioned stimulus for the response of salivation.

According to Skinner, this kind of classical, or respondent, conditioning is far less important in everyday life than another kind of conditioning, which he calls operant conditioning. Operant conditioning does not concern itself with the elicitation of responses by stimuli because most of the responses with which we are concerned are not elicited by any stimuli that can be readily identified. Rather, most of these responses are described by Skinner as being "emitted," rather than elicited. That is, it is seldom any single stimulus that invariably precedes a given response. The response may come under the control of stimuli, but the control is not that of elicitation. In classical conditioning, the reinforcing stimulus is paired with a stimulus. In operant conditioning, however, the reinforcing stimulus is paired with, or follows upon, a response. It is operant conditioning, that is, the change in frequency of responses on the basis of their being made contingent in various ways upon reinforcements, that forms the basis for the kind of theory of learning that Skinner has advanced.

It is safe to say that Skinnerian operant conditioning currently provides the basis for the most influential applications of psychological learning theory to research and development in education. It is, of course, the basis upon which the programmed instruction movement has developed. In many writings, Skinner has developed extremely complex and subtle ways of using the operant conditioning approach to elucidate not merely simple animal behaviors such as lever-pressing by rats or pecking by pigeons, but also many more complex kinds of behavior on the part of both animals and human beings.

Many of the applications to human behavior are still programmatic, extrapolational. But the widespread adoption of programmed instruction indicates the ways in which the Skinnerian approach can be applied to complex cognitive learning by human beings. Skinner's writings also contain many applications of the model to the explanation of behavior of people in groups and in various social institutions--government and law, religion, psychotherapy, economic life, and education. With more or less ingenuity and creativity, human behavior can be controlled by manipulating the reinforcement contingencies of the environment in which the behavior is emitted. That is, the frequency of behavior can be increased by making a positive reinforcer occur as soon as possible after the behavior has occurred. It can be decreased by withholding a positive reinforcer after the occurrence of the behavior.

Some kinds of school learning are easy to understand in terms of this model. That is, it is easy to see how the operant conditioning model can be applied to the instruction of children in the multiplication table and in spelling, in the knowledge of isolated facts in geography, social studies, and science.

But what about the more complex cognitive outcomes of education, such as concept formation, the understanding of principles, and the ability to solve problems? And what about the various affective and social outcomes of education, such as appreciation of art or favorable attitudes toward one's self and others? These kinds of behavior and learning are also amenable to analysis and control by means of the operant conditioning formulation, according to Skinner, especially when they are made overt, rather than covert.

Problem-solving, for example, consists of the learner's changing a situation so that a desired response can occur. Such changes in the situation can take many forms--clarifying stimuli, changing them, rearranging them to facilitate comparison or grouping or organization, and so on. Teachers can help students acquire problem-solving behavior by teaching them the various techniques for changing situations that will permit the desired responses to occur. For example, the student can be taught to translate a verbal statement of a problem into a set of mathematical symbols and then to rearrange these in standard ways until a solution appears. Thus, thinking is reduced to behaving in various ways, and the operant conditioning paradigm is found by Skinner to be applicable both to problem-solving itself and to teaching others how to solve problems.

Even so-called second-order problem-solving, or solving the problem of how to solve problems, which has been called the acquisition of heuristic techniques can be reduced, according to Skinner's analysis, to a set of emitted behaviors controlled by reinforcement contingencies. Even so-called "productive thinking," of the kind invoked by the Gestalt psychologist Max Wertheimer when he described how students discover how to find the area of a parallelogram, is reducible by Skinner to operant behavior. The kind of "insight" that Wertheimer cited, or the student's seeing the solution, can be regarded as an instance of the emission of an operant response controlled more or less by the nature of the conditions, and previous learnings, which make the solution response occur.

## Imitation Conceptions of Learning

The value of the operant conditioning approach in the learning and teaching of complex behaviors has been questioned by some writers, like Bandura. In learning and teaching how to drive a car, for example, one would need to go through a long and altogether non-feasible sequence of steps if one were to follow the operant conditioning approach. First, the learner would be reinforced for incipient responses of approaching the car, then he would be similarly shaped into making the proper responses for opening the car door, sitting in the driver's seat, turning the ignition key, and so on. If persons had to learn to drive a car by the same procedures as those whereby pigeons must learn to execute fancy steps, that is, by having various approximations of the desired terminal behavior reinforced as they occur, most persons would never, according to Bandura, learn to drive.

Instead, Bandura regards social-learning, i.e., identification and imitation models, as more valuable for the description and analysis of this kind of learning and teaching. That is, the learner observes the way in which a powerful or prestigious or exemplary model carries out the desired behavior, and then he does the same things himself. It is observational learning rather than operant conditioning that Bandura invokes as a more appropriate characterization of this kind of learning.

Bandura does regard reinforcement theories of instrumental conditioning, such as Skinner's, as able to account satisfactorily for the control of previously learned matching responses. But he does not regard them as able to account for the way in which new response patterns are acquired through observation and imitation. Particularly when the learner does not overtly perform what he observes while he is acquiring the new behavior, and where reinforcers are not administered either to the model or to the learner, and where the first appearance of the imitative response occurs only days or months after it was observed, he finds it difficult to see how operant conditioning formulations can account for observational learning.

Apart from the question of the way in which imitative responses are acquired, how can operant conditioning account for the way in which they are emitted or performed on certain occasions after they have been acquired? In general, imitation responses are made when the person is able to discriminate the situation as one in which behavior of a given kind will be reinforced. "When we see people looking into a shop window, we are likely to look, too--not because there is an instinct of imitation, but because windows into which other people are looking are likely to reinforce such behavior. So well developed in the imitative repertoire of the average person that its origins are forgotten, and it is easily accepted as an inherent part of his behavior" (2). Thus, imitation in the sense of emitting previously acquired responses that resemble those of a model is simply operant behavior being emitted because of the presence of a discriminative stimulus that has previously been learned to be the signal that a given kind of behavior is likely to be reinforced.

When it comes to explaining the acquisition of new behavior, however, Bandura and others refer to the acquisition of perceptual or other symbolic concepts at the top and progressively less inclusive and more differentiated ones falling below. Other writers have referred to similar ideas as "knowledge trees" (Hickey and Newton) and as "learning structures" (Gagné). Highly generic concepts and propositions thus provide a stable anchorage for related material. The subject matter can have both a logical and a psychological structure, the latter being an idiosyncratic elaboration of the former. In short, in terms of cognitive approaches to learning and teaching, the hierarchical organization of the subject matter is of extreme importance, and the learner's pre-existing cognitive structure for this subject matter is the most important of his characteristics in determining the degree to which he is ready to learn, to retain, and to transfer what he learns. A body of knowledge, well organized in a clear and stable form, is thus the most important outcome of classroom learning and also the most important determiner of the acquisition of meaningful new knowledge.

It is not inconceivable that the cognitive structure conception of learning and teaching can be reduced in various ways to the operant conditioning process. In these terms, such cognitive learning would become a kind of acquisition of verbal behavior and the acquisition of classes of verbal responses. One advantage of such a reduction of cognitive theory to the operant conditioning formulation would be scientific parsimony. Also, it would permit cognitive theorists to profit from the many ingenious analyses and operational definitions that have been developed by operant conditioning theorists. Such a unification of approaches to learning and teaching has not yet, however, been carried out sufficiently well to make it useful for educational work. Thus far, most of the attempts by conditioning theorists to take into account the kinds of considerations concerning organization and structure that cognitive theorists emphasize have been, for the most part, unconscious and unwitting. See for example, N. L. Gage, "Toward a Cognitive Theory of Teaching," where it is shown that the discussion of procedures for developing programmed instruction materials, based on an operant conditioning paradigm, find it necessary to refer to such concepts as the dependence of one rule upon another, rational sequence, meaningfulness, context, similarity, and common property (3:408-412).

In short, the present stage of development of conditioning and cognitive theory probably makes it desirable to use both approaches in practical school work. For some purposes, the curriculum planner and teacher educator should pay close heed to the importance of reinforcement, to schedules of reinforcement, to the use of appropriate models, to the minimizing of aversive stimulation, and many other factors emphasized by Skinner and his disciples. For other purposes, or at other stages in the development of practical programs and procedures, it is important for educators to pay heed to the importance of cognitive structure, logical and psychological organization, meaningfulness, context, relevance, and the sequence of ideas. Although scientific consistency and elegance may be sacrificed by practicing this kind of eclecticism, the gains for practical purposes make it worthwhile. Educators are less likely to overlook important considerations if they take into account the concerns, variables, and formulations of both the operant conditioning theorists and the cognitive theorists.

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The Context of Societal Factors. The goals of the public schools are subject to the constant pressure of the social and cultural forces of the society which supports the schools. In a sense, the schools are merely an extension of the social-cultural goals of a democratic society, but the relationship between the social system and the educational system is not an intimate one. There is no mechanism which mediates between the two systems to insure that changes in one system are reflected by a corresponding adjustment in the other system. Consequently, it is necessary to attend to certain important social and cultural factors which seem, because of their urgency, to merit special attention. These influences are too powerful to be held in abeyance, and it becomes one of the concerns of the educational system to find ways to accommodate them even as the clients--pupils and students--in the schools are to be taught to understand and cope with them.

Some of these social and cultural forces need mention to emphasize their combined potential to influence behavior in the schools. Sputnik and the whole nexus of problems involved in the ideological conflict convey a sense of urgency which accelerates the process of educational change for the sake of national survival. The growth, some call it "explosion," in knowledge certainly is relevant to curricula at all levels. Technological developments, including computers and data processing, have considerable bearing on the future of educational methodology. Population growth and mobility are the cause of several phenomena which present special problems for elementary education. The problem of urbanization finds some pupils crowded into depressed areas of the cities even as others flee to more affluent surroundings. Much of this movement involves points of new contact between the races; a contact which creates new tensions and new demands on the schools to do whatever should be done to put things right. In addition to the problem of race and urbanization, schools are faced with the problem of size--the problem of bigness.

These are some of the important societal factors. With such crucial concerns as these, which affect education at all levels, it is evident that a consideration of societal factors is mandatory in the development of educational specifications.

## Position Paper for Societal Factors

# SOCIAL INFLUENCES ON EDUCATION

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Professional pundits and scholarly researchers have been commenting upon and studying the American social scene with increased volume and reaching ever larger audiences. No longer are the comments of a Drucker or a Galbraith or a Coles or Keniston restricted to the intellectual elite or the academic reader. (1) The statements and reports of studies by these individuals and many others are reviewed in the mass media in large circulation journals and the more cosmopolitan newspapers; they are interviewed on TV shows, their books and articles appear with increased frequency, and they are quoted by or influence the writings of countless others.

To attempt, therefore, to add another comment--and, because of shortness of time and space allotments--doomed at birth to superficial coverage--would, it seems to me, be redundant as well as inadequate. Because of the particular interest to be served; that of providing some perspective upon which more adequate teacher education can occur; I, therefore, feel it would be best to select only a few themes rather than try to cover the whole area of social change and social prediction. Undoubtedly, I will be open to criticism for my selection of those themes which seem to me to be of most significance, and I may err in including or excluding some major trend or another, but this is inevitable in such an endeavor.

The three major themes which seem to me to have the most import for teacher education which are apparent from an examination of current social affairs are:

1. The inability of world leadership to cope with ideological differences which precipitate war, and the resultant failure to implement institutional procedures to resolve inter-nation problems peacefully.

2. The difficulty of achieving personal and social adjustment to displacements due to technological shifts whose by-products are inter-racial tension and violence, and the diminution of exits from poverty.

3. The incompatibility between social valuation of the attributes of education--a degree, graduation, a license or certificate--and the factual failure to support educational institutions and educators.

## The International, Ideological Conflict

The United Nations as an institutionalized effort to establish procedures for intervening in inter-nation disputes has not been successful. Although U. N. efforts and activities have been helpful, they have been peripheral. The active commitment of the major nations of the world to this institution has not been forthcoming, and among those who have been in flagrant violation of the U. N. procedures has been the United States. The permanent cessation of hostilities in Viet Nam, which may take place at any time, is, of course, essential. However, there is great likelihood that the damage done to the concept of what American democracy means, abroad, as well as what our role might be in other international disputes, cannot be repaired. Thus the ideological conflict may increase, and the ideal of democracy may become indefensible in actual fact. (2)

The impact of the current and potential insecurity of the democratic ideal upon American youth is already apparent. The anti-war protests are only one symptom. They are significant because they attract the best students, on the best campuses, who are more committed to democratic ideals, than their colleagues. (3) There are, of course, many bright and able young people who are not involved and are quite apathetic about what is going on. But significantly, the protestors are not low achievers or those unable to make the academic grade. Some may be selfish; the war is taking away their future, the secure graduate school future that leads to the better job, the better college post, the more prestigeful law firm. But in the main, the war protesting students are angry about war as war--about a war which no reasonable argument appears to make justifiable. The next question: Are democratic leaders really "democratic?" Are the words of democracy and the institutions of democracy empty, controlled by a few of the power elite who can make money out of war, can make money out of exploiting anti-communism? What is really so wrong about communism? In fact, what is communism? (4)

The students, many in the young adult community, many religious leaders, many left-over intellectuals have made it quite apparent that merely protesting about an unpopular "war" has further consequences: the questioning of some of the premises upon which the democratic-communist ideological conflict rests, and which is the assumed base for the war to begin with.

Such protest, from whatever segment of the population, has polarized positions. Those supporting the current American involvement in Viet Nam are more vehement in the defense of the U. S. position, and more distrustful of their fellow-citizens who question the Government's policy. On some campuses, the hostility between the anti- and pro-war groups has become tense and in places has verged on violence; the confrontation of protestors with college and university administration or with representatives of the community in many instances lead to arrests and also to some violence from both sides. (5)

In this context, where does the teacher education program stand? The less likelihood of involvement by women in protests of any kind leads to the observation that, since most prospective elementary teachers are women, such individuals as students are among those sitting on the "outside." They are concerned if a boy-friend is drafted: but they are not activists. The selection of elementary education as a career path is often an expedient, and does not imply a life-time career commitment of any depth on the part of many, if not most, future elementary teachers. Teaching elementary school is something to do, and it shows Dad that his investment in educating his daughter does have some possibility of a pay-off; at least, she can support herself after college if she hasn't been able to get married by then. Or she can support the husband she caught, as he moves on to graduate work or completes his draft-interrupted education. (6)

At the secondary teacher education level, one finds a somewhat similar pattern in many of the major areas of subject matter instruction, except for the future teachers of social studies. The person seeking secondary teaching is one who likes his subject field, and typically also likes the subject he may teach more than he likes adolescents. Many future secondary school teachers have never really faced the fact of what it might mean to teach 150 adolescents until the semester or so before student teaching; just prior to student teaching many tend to panic. It dawns on them that teaching is a person-oriented occupation; not a subject matter occupation. (7) We find many future secondary teachers resentful of courses in educational pyschology or child study. "I want to teach mathematics; why do you want me to worry about the students' problems?" is a comment heard quite frequently. If not expressed directly, it is observable in the professional rejection of increased pyschological or sociological content in the professional training of secondary teachers, a point we will return to later.

In the field, however, the activist teacher finds survival difficult. One high school history teacher, in his first year, who was among the few who participated in peace rallies and similar programs, found a college colleague in his new high school who was very much pro-war. They talked with each other and felt that an open discussion might be valuable. They agreed to present their positions at an after-school "debate" open to anyone who wished to attend: students, fellow faculty members. The principal approved. But then word got out to other faculty members. The principal was visited by several other faculty members who stated that they would "picket" the proposed discussion in the uniforms they wore in the Service. At this threat, the principal withdrew his permission for the discussion.

Teacher militancy on their own behalf for salary raises and other aspects of the job situation is becoming a genuine fact of life, and one that confuses the administrative bureaucracies and the public a great deal. (8) But teacher militancy which has to do with current social events is rare indeed, and such teachers, as in the incident noted above, may become so discouraged by the public school climate to withdraw from teaching, or move into the somewhat more permissive atmosphere of the college or university. Though even in the rarer air of the ivory tower, the dissident instructor is apt to be reprimanded, in some cases dismissed, before he achieves tenure or he finds the journey to promotion blocked or slowed down. (9)

Interestingly enough, teachers of education courses are often among the most militant and also among the most conservative. The militance may not be the kind that takes the form of active protest, but more likely to be the kind that stirs students to think and question. Among the many complaints about courses in education, particularly those which deal with social or philosophical values, is that they raise a lot of questions, but don't give any answers.

The typical education student, as noted above, is not known for his militancy so that when he is enrolled in a required or elective education course in which he is asked to consider policy questions which do imply some personal involvement, he becomes annoyed and critical. One instructor, who has a penchant for stirring up her students, reported that, at the end of a particularly violent discussion about current events, and their implications for education, was angrily though sadly denounced by a student: "I don't like this course; I didn't think about any of these problems before I took it and now you have me all upset thinking about them, and I don't like it!"

It must be noted, too, that departments of education are also derided for being peopled by non-intellectual faculties, nice little old ladies, or male facsimiles of the same, who teach a "purified" course in children's literature (if they teach one at all), and who stress the values of developing "nice" handwriting, "good" behavior, an "orderly" classroom and pretty bulletin boards. The education of many elementary teachers would probably be examined with a critical eye, and found wanting, particularly in terms of the social crisis within which this analysis is undertaken. Discussions with educators both within and without the university suggests that, in many instances, elementary school personnel persist in seeing children in simplistic terms: such problems as war, for instance, are just not something to bother young children with.

The fact that, as I look out the window, I can observe the pre-schoolers next door playing soldier, with one child happily shooting down three of his small playmates, seems not to be recognized by educators as of educational import. Yet the war, its effects upon the older youth and adults around them, the visual impact of war as seen on TV, which children watch without much control of discrimination, the war toys which fond parents provide them, must leave some residue in the minds of these children. What is it? Are they being thus conditioned to a world in which war is a normal state of affairs? Where death by violence is unremarkable? (10) Where school is perceived as a place where anything important is discussed?

One fifth grader was extremely indignant because the weekly "newspaper" which provides them with in-school current events was outdated: it had reported that President Johnson was going to run for re-election, when the boy already knew via TV that Johnson had declined! The boy said "everyone else" knew this, too, and the teacher did not even mention the discrepancy between the news story and the true report. When pressed as to whether all the other fifth graders knew the truth about the President's position, our fifth grader finally admitted that at least one other classmate knew it, but the point is that the alert student, as young as fifth grade, begins to wonder what relevance the school may have. (11)

In one discussion with a group of elementary public school personnel representing a large region, it was emphatically declared (and not really challenged) that "death was too sophisticated a concept for young people--fourth grade--to discuss." In a nation at war, who escapes the presence of death? In a world of any kind, who escapes the presence of death?

The turmoil, then, which the nation faces in terms of a reconsideration of its international role, and which has precipitated some major debates about democratic principles and practices on the international scene, should be a basic concern in the education of future teachers. Should they remain aloof from the turmoil--as many of them personally perceive themselves to be--because of their role as teacher of the young? Or should they, because of that role, be among those most deeply concerned and involved? The neutral role of the educator, particularly those who work with the "impressionable" young person, K-12, has been one long defended in the literature. The public has in many instances reacted swiftly and decisively when teachers appear to be too active in public affairs.

Although the Hatch Act specifically excludes educators from its coverage, most teachers feel politics is not for them, and in some places, despite the law, teachers are not permitted by Board policy to be active in public partisan affairs. The behavior of teachers in response to political problems plays a role in many aspects of education: in recruitment - those who enter teaching; in retention - those who stay in teaching; in role perception - whether the teaching act is seen as self-enhancing or not; and the perception of the community's response to teacher activism. (12) The research would strongly support the statement that teachers as a group are not responsive to major societal conflicts in terms of their personal and educational roles.

What emerges, when one looks particularly at any great social problem, is a picture of the school as both aloof from involvement, but also most likely to support the traditional, conservative (and thus most idealistic) view of American democracy. It was reported, for example, that the time when students are most likely to consider Government employment a positive value is when they are in secondary school, before they have learned the more "adult" stereotype view that Governmental bureaucracy is a back-water for little minds. The high school student, and his slightly older peers in college, are those most avid about lowering the voting age to eighteen, and their feelings and pronouncements make it quite clear that they believe in the power of the ballot. As they get older, however, particularly in the current crisis over the "war" and the draft, the student and young adult not only begins to wonder whether the democratic principles he was educated to accept are really operating, but also to inquire into the possibility that the system may not be working at all--that it is all a "put on," is phoney, is a way of placating the masses while the powerful few run society as they wish.

The greater the distance, as seen by the young person, between what he thought life might offer him, and what he actually sees around him, the more likely is one to find the phenomenon of the "hippie" cult. The lines from Dover Beach might be their theme song:

> Ah, love, let us be true,
> To one another! For the world, which seems,
> To lie before us like a land of dreams,
> So various, so beautiful, so new,
> Hath really neither joy, nor love, nor light,
> Nor certitude, nor peace, nor help for pain;
> And we are here as on a darkling plain,
> Swept with confused alarms of struggle and flight,
> Where ignorant armies clash by night.

Matthew Arnold, Dover Beach

The impact of war on three generations of Americans, plus a devastating economic depression and an economically unmanageable degree of affluence are events that cannot be dismissed, and are not dismissed when one consciously considers them. (13) However, the major point that must be reiterated here is that, as one looks at today's response to "war," one notices a new type of questioning, both more querulous and more profound. Everyone now alive in this country has, inescapably, been a participant in the events of the last four decades. We need to consider to what extent educational institutions have responded to the drastic impact of wars, the call for international order, and the retreat from the institutionalizing of international order by our own country. The threat to genuine democratic commitment is one that must be faced. (14)

## Personal and Social Adjustment

No reader needs to be reminded that American society has received one of the worst jolts in its history in the wave of burning, looting, and massive destruction following the assassination of Dr. Martin Luther King on April 4, 1968. The causes of the disturbances will be argued by social scientists for decades to come. Apparent at the moment is the obvious situation: there is a dissident, militant minority in America ready, willing, and able to create chaos in city after city. (15) Whether this is riot or revolt depends upon one's perspective. In a recent speech, one interpreter of the militant Negro protest suggested that every Negro re-read the opening paragraph of the Declaration of Independence, and whenever a "riot" breaks out, to read it to white civil authorities.

### Population Mobility

There is little disagreement among observers that the mass disturbances of recent years have had at least a portion of their beginnings in the migrations of large populations from rural areas to urban centers, and from Southern states to Northern and/or Middle-Western states. The migration has been in part a response to technological change. And the frustration of the relatively new city resident to the conditions he finds--unemployment, miserable housing, poor schools--are symptoms of technological change. Not only has the tenant farmer, small farmer, marginal farmer, and farm laborer lost his economic base, (16) he cannot find a market for his labor in the city. (17) He can starve in the back-woods of Alabama, where discrimination keeps him not only beyond the reach of farm subsidies, but off the welfare rolls, (18) or he can half-starve in the cities, on welfare and temporary unemployment payments. (19)

In a brilliant essay on what he calls the "M" factor in American history, Pierson discusses the significance of this factor: Movement, migration, mobility. (20) The movement of peoples inevitably brings with it not merely a change of locale, but the new situation, being literally a different one, provides different kinds of institutions: the churches are different, the schools are different, health services are different. Ways of behavior which made it possible to cope with situations "back home" are inappropriate for the new location. For the under-educated rural migrant, this means that he usually lacks the educational skills which would help him find out how to cope with the urban environment. (21) The inability to cope, which means an inability to find a secure job, maintain a safe and secure family, raise healthy and competent children, to analyze the present in order to predict the future, produces a cycle of inadequacy--well documented by years of study of the "hard-core" poor. (22)

## Urban Ghettos

If previous generations could find a way of breaking out of the poverty and limitations of slum life, it is quite clear that the situation of the slum dweller today is not comparable. (23) An Italian migrant could learn English, could--if necessary-change his name from Martinello to Martin, and find that, if he developed some marketable skill, he could find job security. After several generations, the Jews of America have broken out of the limitations of the ghetto through education, through name changes, even by having operations which straightened out the so-called "typical" Jewish nose. (24) The negro, however, cannot change his appearance. Though thousands "pass" every year, particularly in areas of the country where the white population is not sensitized to the least sign of "Negritude," the mass of the American Negro population is seen by others, and perceives himself to be, marked or "stigmatized" for life. (25)

That differences in appearance may not be necessarily barriers to achievement is illustrated by the economic progress of great numbers of Japanese-Americans, and, to a lesser extent, Chinese-Americans. The difference between these groups and the American Negro may be accounted for by a look at their different cultural histories in America; the Japanese and Chinese brought with them and adhered to a distinctive culture which they prized and protected. The Negro American was denied retention of his own African heritage, and permitted only to develop the minimal coping mechanisms of persons in bondage and in poverty. (26)

The sanctions which kept the Negro "in his place" (27) operated as long as there was a recognizable and supportive place to keep him in. As long as his labor was needed on the farm, as long as there were large numbers of menial tasks in which he could find consistent (if miserably paid) employment, then the Negro by and large stayed in his place. (28)

Technology (and war and depression) has changed all of this. The place for the Negro is gone when it is identified primarily as the Negro's "place." Automatic elevators, for instance have eliminated thousands of jobs often held by Negroes, within only a few years. Inflation has cut the executive's salary so that his wife cannot afford a maid, also often Negro, who is then paid only a semblance of a living wage. Anything less than a minimal wage and there is no inducement to get off welfare rolls. "Why should I work for less than I can get on welfare?" is quite a reasonable question. (29) The economic squeeze of affluence has caught the very poor with increasingly fewer exits out of poverty. (30)

## Failure of the Schools

The school, as one exit point, is not serving the Negro in the inner city. A deluge of reports on inner city education are available; further documentation would be repetitive. (31) Despite the massive effort that all of this publication would suggest, it is also obvious that relatively little is happening in the inner city school. Despite the Bundy Report (32) there is little support for greater local control of schools by inner city groups. Not only is the existing school bureaucracy opposed, the teachers' unions (whose main strength is in large cities) are suspicious of local demands for control of hiring, firing, and curriculum.

There may be justifiable reason to be suspicious of local control of public education. As Pierson (33) points out, the migrant seeks new opportunities in a new location, but he also wants things to be similar in value terms to what he left behind. The semi-educated Negro of either North or South tends to have a simplistic view of schooling: school should not be fun, children should be beaten if they deserve to be; lessons should be rote lessons with emphasis on rigor, discipline, quiet, obedience. (34) In the process of desegregation, many white school personnel were dismayed to find how formal and authoritarian were the Negro schools in the same system. It is predictable that local control in some segments of the community may produce worse rather than better education, as "educators" define "good" education. A difference, however, must be noted: whatever form the educational enterprise takes, if it has full support by parents and local opinion leaders, it is probable that it will be educational. In other words, the educational means utilized, which may be against all we have learned about how people learn, the optimal conditions for learning are not nearly as relevant as the active supporting role of home, family, church. The school that Kazin so eloquently describes in his autobiography, A Walker in the City, (35) was light-years away from home values; home teaching, and his parents' experiences. Yet, because they believed ferociously in "education" and the absolute authority of the "teacher," Kazin and his fellow young Jewish immigrants did indeed learn the lessons of the school, though the schools broke every rule of learning known to psychologists today.

The failure of the schools is in part an aspect of the failure of the "pay-off" that education promises. For Kazin, the pay-off was a good probability; for the Negro youth of today, the "pay-off" is not visible. (36) The programs to make the Negro school drop-out or non-educated Negro youth more palatable to employees has been neither very widespread, nor in some instances very effective. In assessing one program to prepare Negro youth to enter the job market, the observer concludes that recognition of

> ...inequities in the job and opportunity structure of America are minor compared to the deficiencies of Negroes themselves. In the end, Northern liberals and Southern racists agree; The problem is mainly with Negroes, not with our society. This fallacy underlies much of the war on poverty's approach and is indicative of the subtle forms racism is taking in America today. (37)

## Alienated Youth

The significance of youth's response to events today, which is characterized by the slogan, "Make love, not war," is also an indication of what might be called a "retreat from the future." Ginzburg and associates have commented on the role of the optimistic tradition in the socialization of youth in America. (38) One could always, so goes the traditional message, if one tried hard enough go further and gain more security, wealth, and leisure, than one's parents. (39) The optimism that saw on the frontier a chance for a new life, lured thousands to the desolate lands of Montana, North and South Dakota, and brought the displaced from every country in Europe to the mines and factories of the East.

But it is just this view of the future which youth now views as either hollow or misleading. As the current war has introduced one uncertainty into the lives of almost all young people, so has technological change brought new elements of insecurity. The glowing reports of the ever-expanding potential of the computer are actually music only to the ears of technicians and electronic inventors. Even teachers have to be reassured that the "talking typewriter" will really not replace their human voice. Many are not so sure.

The trouble, of course, is that the electronic efficiency of a computer is more amenable to the needs of this complex economy, and, in fact, is a contributor to the ability of the economy to become even more complex. More bridges can be built faster, more highways planned, more new machines designed and tested, just because the computer can produce the needed mathematical figures at rates which human calculators could never match. Then what do the human calculators do? Is it really inspiring to see a picture of a massive and incredibly intricate plant, such as one which refines crude oil, and be told that only a small crew of maintenance men are needed, plus one or two to monitor the computer which controls the whole works? Where have all the people gone? (40) At the moment, I have heard described a proposal which, if accepted by the government and industry, could make obsolete thousands of men and women who sit at punch card machines (to service the computer), so that even their computer-produced jobs will be eliminated by another inventive use of electronic equipment!

For some the blessings of technology, mean affluence. For these, the future may lie in several directions. One can be seen in a recent ad for liquors which has the tag line, "What do you drink when you grow up?" The message is clear: let's induce young people to think of the "liquor life" as epitomizing what their achievement drives should realize for them. The life of split-level suburbia or luxury town houses, all with pools and air-conditioning, expensively decorated, is presented as the new design for living.

One magazine, distributed through home economics classes in the junior and senior high schools of America, is filled with artful ads glorifying large diamond engagement rings, sterling silver, crystal glassware, and the other ingredients of the life of affluence. This particular magazine, in between the ads, has at least one story whose theme is adolescent love pangs in assorted variations (and whose literary quality is below that of a grade "C" movie) hints on how to act on a date, how to care for one's face and skin, new hairdoes, new clothes styles (which are designed to make a boy not want to behave on a date, incidentally), and recipes. The obvious fraudulence of this particular magazine (which my seventh grade daughter subscribes to via her home economics teacher) is made even more appalling by the fact that eminent educators sit on the board which supposedly supervises the publication of such material. Reading this magazine would give one no clue at all to the fact that the world of these girls--and their boy friends--is more apt to include "Bonnie and Clyde" than it is "The Wizard of Oz." Even the movie reviews in this magazine ignore the movies which teen-agers will see; only those movies deemed "nice" to see are reviewed. The personal and social problems of the Pill, drastically shifted sexual standards, interracial tension, or even the Viet Nam war, do not exist as far as this magazine is concerned. What kind of view of life, not to mention what kind of view of school, will these young women develop? Certainly, they will not consider the school a place where the significant problems of life are considered. But secondly, they will also be educated to want the big engagement ring, the sterling silver, the liquor after dinner.

As the young adult begins to realize that the "liquor life" is either too expensive, unobtainable, or not worth it, a spread of alienation of American youth may result. (41) It is hard to make a connection with adults when the goals they seek, preach, or even have obtained appear to be without value in a world shaken by war, poverty, disease, and imminent destruction. It becomes increasingly more difficult to establish enduring relationships with even one's own age-mates. The fragility of marriage today is not only a statistical fact, it means a whole new concept of family life, child rearing, and child enduring. (42)

Family life is under other pressures promoted by our social order. The forced separation of families due to war is one factor; but increasingly industry itself is a prime cause for family separations. The planes that load and unload every Friday and Sunday are almost completely filled with men--sales personnel, government field people, travelers who serve national business. So it is not just among the poor that there are fatherless families; among the rich and upward mobile the father is much more likely to be absent from home because he has a traveling job, or because he commutes long distances. The weekend father is one price of affluence; no father is the price of poverty. (43)

### Family Life

Of all the blind spots educators may have, one at least is where family life is concerned. The youth have their eyes open: they can see what they are missing, if they are in the slums; (44) and they can see the stress and strain and personal disaster that hides behind the pretty suburban picket fence, and they are confused. Some make precipitate choices: "No more school for me" or "I shall get all the money out of the family they will give me, I will go along and get good enough grades to stay in school and college, with car and clothes, but I won't end up where they think I will." Some run away, (45) and some commit suicide. (46) In any event, whatever the degree of disowning of current adult values, many young people are just not "buying the system." (47) These are among the brightest, often, with the most potential, the most creative in many ways, and those who have learned the lessons of independence, initiative, and ego strength which are American personality values. (48)

Others, the vast majority, do, however, accept the system. Their response is to ignore the prophets of doom, and believe that a diamond ring is forever, enjoy self-indulgence to the limit (but avoid getting caught) and let the world burn.

## Faculty-Student Indifference

In an interesting analysis of what students do in their free time when they are not engaged in studying or in classwork, it was found that not only is there student indifference to intellectual matters, there is also "faculty indifference to student matters." (49) The out-of-class life of the student is regulated by persons who are not academically oriented themselves--deans of student life, fraternity housemothers, and their like. There is also lack of interest, if not outright resistance on the part of faculty to be concerned about student out-of-class activities. "For faculty to intervene strenuously would be unseemly, especially so when the faculty perceives the college as functioning to free students from parental controls."

> "From the point of view of educational policy, the most basic finding of the present study is that the informal, peer-group aspect of student life in the university does not generally support the intellectual-academic objectives which are the manifest educational function of the university...Even by the most generous definition, intellectual activities (other than regular academic work) took up only three and a half hours a week or half an hour a day of student time." (50)

The particular irony of the lack of faculty intervention in terms of out-of-class student activities is that, in the name of freedom, the students, particularly girls in university-run housing on most campuses, have actually less freedom to interact with their peers than they would if they were to remain at home! The university, of course, is afraid that when youth are free to meet as though they were young adults, the only interest would be in cohabitation. The study of the various student protest movements suggests that far more threatening to university tranquility than a few unplanned pregnancies, is the intrusion by student activitists into university affairs when students do get a chance to meet, talk, and think together outside the classroom! (51)

The response of young people to today's world is the nearest indicator we have as to what might be the significant trends for the future. The youth in poverty is either destroyed by it, alienated, apathetic, angry, or striving to get out. For the more affluent, education is the preferred pathway for achievement, but it is a non-intellectual education. For some of the middle class, college educated and potentially college oriented, there is apathy also, but there are also various protest pathways: active political protest, demands for more relevant education, insistence on participation in educational administrative policies, or flight--into hippie-land, drugs, (52) or "cool" detachment.

Thus technology and its impact create not merely visible new products and new processes, a new social response takes place. The displaced become ever more desperate, and the beneficiaries of the system either more insistently complacent, or find more defiant ways to express disenchantment.

## The Role of Educational Institutions

The role of the educational institutions of our society presents us with a third major dimension of social concern with particular implications for teacher education.

As has been noted already in the previous section, the university or college, committed to intellectual-academic goals, does not permeate the lives of students to any great extent. (53) This is not a new story. Americans have been ambivalent if not suspicious of the world of the intellect from the mid-19th century. (54) Even before this time, in line with European traditions, intellectual concerns were for men, and for the elite. There was always some suspicion about the dangers of schooling the masses, and women. One can observe the same ambivalence in the educational programs of many "developing" countries, who profess great interest in mass education, yet keep to either out-moded forms of advanced education, or guard entry into higher education so that only a few of the elect may pass. (55)

Americans boast, however, with genuine approval, that no other country has educated so many, for so long. This is true. But the content of this education, the environment in which these extensive years of schooling have been spent, is an area of contradiction and confusion. Americans wish their children to have lots of education, but there is some grave question as to what this education shall do for the children. (56) Should it make them think? Make them obedient? Keep them out of trouble? Give them vocational skills? Train them in manners, and cut their hair? (57)

### Critics

The numerous critics of education, from Bestor, Hutchins, and the Council for Basic Education (58) to Goodman, Friedenberg, and Holt, (59) are extremely far apart. The critics from the "right," if that is the proper designation for them, are concerned about the academic-intellectual quality of education, about the ways in which the heritage of great ideas is transmitted to emerging generations, and about the rigor with which educational ends are pursued. The response to these critics is that they are proposing an educational elite, and, in terms of what we now know about who gets an education (60) those who have more (of brains and money) will be the ones to benefit, and their children in turn will benefit; those who have will get more; those who have less will continue to receive less.

### Critics on the Right

There is a more hysterical group, over the far right edge, which must be of concern to us before we analyze the position of the "left" in educational criticism: these are the persons who detect subversive teaching in all kinds of seemingly innocuous activities. An outrageous example was the member of the Michigan State Board of Education who questioned the inclusion of the legend of Robin Hood in the school curriculum because he stole from the rich to give to the poor! Or the removal of a children's book from the shelves of Georgia libraries because it was a fanciful tale of the marriage of a black and white bunny!

More dangerous is the kind of criticism of a Root (61) because of the claim, by an author with impeccable academic qualifications (a professor of history) that the textbooks currently utilized to teach American History were really teaching socialism, criticism of the American way of life, and other horrifying things to impressionable youth, was taken seriously. The report by Root was sufficiently persuasive that the books listed, among the top ten best selling American history 11th grade texts, were listed as not acceptable for school purchase in Mississippi; one does not know how many other states took the criticism of Root as seriously. But the DAR and other ultra-patriotic groups have never been happy with aspects of American education; they resent favorable discussion of the United Nations or UNESCO; they keep a close watch on any tendency to provide reality rather than mythology when it comes to discussing the American system and American heroes. These critics are most effective at the local level. The episodes of censorship (62) and interference with local educational efforts--public school, college, and even public library--are continual and numerous, though unknown by most persons, except those immediately involved. (63)

## Critics on the Left

Now let us see the role of the critics of education from the "left," if that term can be used with proper caution. These critics see the educational system as being in thrall to the very things that the critics of the "right" claim the schools are not doing. According to persons like Friedenberg and Goodman, (64) the schools teach an empty patriotism, an unquestioning conformity, an anti-libertarian point of view. Research (65) is cited which shows that high school students are fairly reluctant to extend the benefits of the freedoms protected by the Bill of Rights of the Constitution to most people in many circumstances. Similar complaints are voiced about college education; that students enter as freshmen and emerge as seniors with their values untouched, (66) and basically conservative, if not anti-democratic.

More "personal" criticism from the left-wing group emanates from persons like Holt and Neill, (67) who claim that education is actively destructive of all that is natural and good and growth-inducing in young people. In Henry's terms, to succeed in school one must "learn how to be stupid." (68) More objective sociological analysis by Waller (69) brought up to date by Grambs (70) identifies the ways in which the "system" works to reward conformity and punish deviance, to inculcate an unquestioning patriotism and suppress critical analysis of contemporary (or even past) problems, to inhibit initiative and to make creativity suspect. (71)

The battle of the critics is far from won. There are some indications that agreement has taken place on one basic issue: the schools and universities are not doing the job. Students are spending ever longer time in school, and appearing to gain less of whatever the critic thinks he ought to have gained. It is agreed that the schools have failed miserably in meeting the problems of the grossly disadvantaged in the inner-city. There is agreement that SOMETHING MUST BE DONE!

## Problems of Change in Education

The distress of school people is becoming ever more evident as the studies increasingly describe in detail all the dirty linen of educational shortcomings. (72) The public is becoming increasingly better educated about education, and increasingly impatient with the inability of the schools "to produce." The inability to agree on the product, however,--as noted above--is probably the greatest deterrent to effective remediation.

The other deterrent to doing anything basic about remedying the failures of education are educators themselves. They are, to make a perfectly obvious comment, products of their culture. Because of selective factors entering into who goes into teaching and who remains, (73) the educational establishment is apt to resent all criticism, and resist most prescriptions for change. (74)

Interestingly enough, the changes that are observable in education have come from two sources: one, the new Federally funded programs such as Head Start, Follow-Through, Title III of the ESEA Act, (75) Job Corps, Teacher Corps, Neighborhood Youth Corps, (76) and second, the new technologies--computers, and classroom "machines" of various types--overhead projectors, 8 mm closed loop films, self-loading projectors, tape recorders, paper-back books (or instant libraries from micro-fiche), and the ubiquitious duplicators with the ultimate achieved in Xerox and its imitators. There is great industry investment in the adoption of most of these new technological improvements. The recent mergers among publishers and other media is very significant indeed, and noticed by few educators.

Change in education has not come about, as Chall so adroitly points out in her book on reading, (77) because of research. Change in the educational process has resulted from new money (Federal), and new technologies. Educators as a whole are immune to the findings of research. (78) It can and has been proven by research that success leads to success, and failure is self-replicating, but schools embody the almost perfect system for proving the above to be true; failure is built-in to the sorting and grading and testing process. (79) No effort to induce educators to give up the failure base of education has succeeded; the public is against it and educators are against it. For some to succeed, others must fail. The social consequence of this position has remained beyond the tolerance level of educational leadership on the whole, (except for the critics noted above) and certainly beyond public acceptance.

There is little perceptible hope of resolving the paradox that is emerging: technological inventions may well make basic learning if not advanced learning available and accessible to almost all learners; tradition is based on sorting, grading, and failing, so that only some can learn. (80, 81, 82)

Interestingly enough, the education of educators, particularly at the advanced graduate level, puts a heavy emphasis upon statistics and "research." It seems rather obvious that the distance between the academic "research" which must be put in a dissertation to get the degree, and the imperatives of the public school or university are antithetical; the hurdle of two or more courses in statistics, just like the foreign language requirement, do not appear to fit the realities of the institution. At least, one does not observe educational leaders who hold degrees any more prone to use research to guide policy than those without degrees.

The lag between graduate programs and practice is probably no more remarkable in education than any other academic discipline. The major difference is that education at the graduate level has failed to see its mission as similar to that of medical education: training practitioners in the use of the tools they will really have need to use in the emergency room. The advanced education of educators is comparable, in its ineffectiveness, as would be a theory course in surgery for one who has to be called upon for the imminent practice of surgery. The latter would not be acceptable; the former is the mode of graduate education of educators today.

Teacher education, like all higher education but peculiarly different, is out of phase with the above major social factors. How teacher education can become more responsive and more responsible is worthy of great and consistent attention.

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The Context of Research. The use of research findings and the role of research in teacher education comprise the final important context to guide the move from general goals to educational specifications. The great majority of research in teacher education has been of the normative survey or comparison type dealing with teacher education programs, methods, and practices. Such research, coupled with speculations about teaching and learning, pedagogical lore, and practical experience, has constituted the previous fundamental knowledge base for the practice of teacher education. Many large foundation grants in teacher education have been given for program development but not for theory development on a sound research basis. Unfortunately, much of the research literature on teacher education reveals a lack of a theoretical basis for many of the studies. Consequently, teacher education remains fragmented and detached, and much effort must still be put into the research and development of a theory-based program of teacher education.

The foregoing description of the research situation does not, however, suggest that all research in teacher education has been valueless. Although much of it has not been adequate, there is a sufficient body of useful, experimental research relating to teacher education which has not been properly utilized or given sufficient consideration in developing present elementary teacher education programs. Empirical survey, *ex post facto* and the *a priori*, conceptual framework types of research need consideration. Further, since education has drawn much of its content from other disciplines, there should be a continuing consideration of research from these other disciplines. Research must finally have its proper place in the development of modern teacher education models. It has been ignored or misused on too many occasions.

## Position Paper for the Context of Research

# THE RESEARCH CONTEXT AND THE GOALS OF TEACHER EDUCATION

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In preparing this paper on the research context I have not attempted any kind of a summary of research related to teacher education or to teacher effectiveness. The Handbook of Research on Teaching represents a thorough review of the area as it stood in 1963; anyone who has read that volume, or a reasonable portion of it, realizes two things: that the literature is vast; and that it does not add up to anything that can be summarized in a meaningful way in a paper as brief as this one.

What I have tried to do, instead, is to put down some of my own current thinking on the subject. Most of my professional life has been spent doing, reading, or thinking about research in teacher education--and trying to make sense out of it. This paper will attempt to convey the results of this effort. It is, of course, impossible at this point in time for me to trace many of these notions back to the specific pieces of research out of which they grew, so I shall not try to do so. What I say may properly be regarded as nothing more than personal opinion. Informed opinion, I hope; but opinion still.

The relationship that ought to exist between research and teacher education is quite clear. The plan or design of a program for a modern teacher education program should be based on the answers supplied by the research literature to three questions:

1. What are the behavioral skills a teacher must possess in order to be effective?

2. What are the characteristics a student must possess before he can acquire these skills?

3. What are the training experiences which will help the student acquire the skills most efficiently?

Unfortunately, research has not yet produced useful answers to these questions. In particular, the failure to answer the first question has precluded any possibility of success in answering the other two.

This failure may be chiefly due to methodological defects which plague most of the studies. Research in learning has only recently begun to abandon an unsuccessful attempt to imitate medical research, as it becomes obvious that the similarity between physiological processes in men and mice which medical research has used to such advantage does not hold for the psychological processes which concern the classroom teacher. Research in methods of teaching has been even less successful in efforts to adapt the methods of classical physics and the law of the single variable to the fantastically complex phenomena of teaching and learning.

But there may be a more fundamental flaw underlying research of both types: an inappropriate model. Research in learning has by and large ignored the teacher; research in teaching has neglected individual differences among teachers. Recent research in the teaching-learning process (as it is called today) is beginning to recognize these differences, and may yet begin to develop the understanding of the nature of effective teaching we need as a basis for training teachers.

Recognition of individual differences among teachers, and all that it implies, requires a model for research in teaching radically different from that implicit in past research. And the teacher education program of the future also needs a new model if it is to keep pace with the new science of teaching as it develops. I shall now sketch in rough detail the principal features of such a model.

## A Model for the Study of Teaching

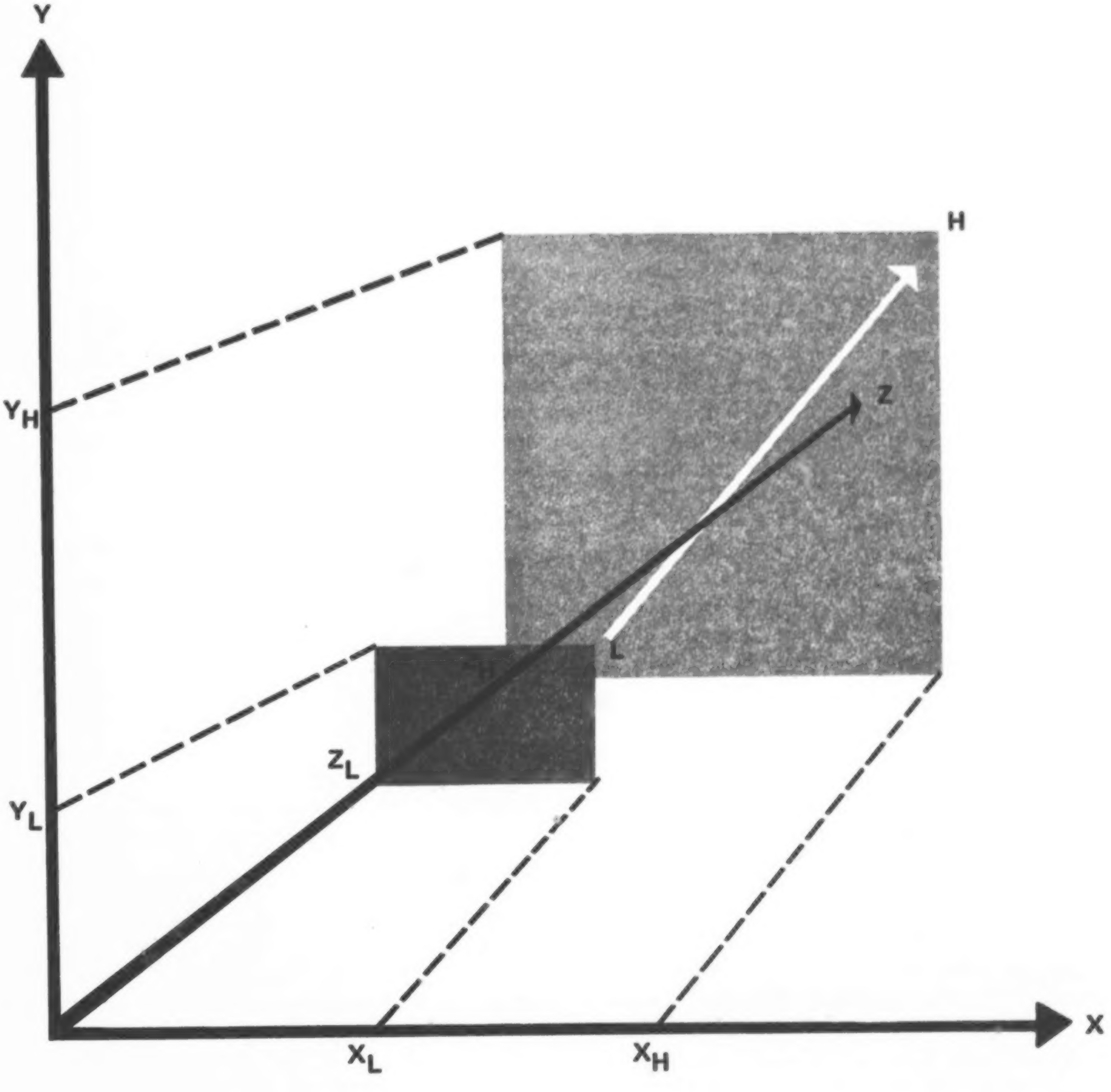
The crucial distinction upon which this model is based is that between teacher effectiveness and other teacher characteristics. While the ultimate goal of a teacher education program has to do with teacher effectiveness, more immediate objectives have to do with other characteristics (especially behavior patterns or strategies), and it is in this domain that the program must operate.

Let us imagine a set of N dimensions describing N characteristics of teachers which are orthogonal--that is, uncorrelated. Assume that there exists a measure for each characteristic such that for any given teacher there is a point on each axis of the space corresponding to the degree to which that teacher possesses that characteristic. The N points locate a single point in the space representing all of the measured characteristics of that teacher. Two points that are close together will represent two teachers who are very much alike; two far apart will represent very different teachers. For simplicity in this discussion let us assume that the characteristics represented by the axes are all behavior dimensions--dimensions describing how the teacher behaves while teaching in a population of pupils and situations in which he must work, while he is trying to achieve a certain set of objectives.

Figure 1 is provided to assist the reader in visualizing such a behavior space. In the figure it is assumed that N = 3 --that there are three dimensions of behavior in terms of which each teacher is to be described: X, Y, and Z . Two points have been plotted corresponding to two teachers. Point H represents a teacher whose behavior scores are $X_H$ , $Y_H$ , and $Z_H$ ; point L represents a teacher whose scores are $X_L$ , $Y_L$ , and $Z_L$ .

Let us suppose that point H represents the pattern of behavior a teacher education program is designed to produce--represents the behavioral goals of the program. And let us suppose that point L represents the way

Medley—Figure 1.
A Model for the Study of Teaching.


Y
H
$Y_H$
Z
L
$Z_L$
$Y_L$
X
$X_L$
$X_H$

a certain student behaves under the same circumstances. Then it is clear that what the training program must do is change the student's behavior so that it resembles "effective" behavior more closely--that is, to move L toward H.

By comparing $X_L$ to $X_H$, $Y_L$ to $Y_H$, and $Z_L$ to $Z_H$, it would be possible to describe the needed changes in terms of the three known dimensions X, Y, and Z--to plan a strategy for achieving goal H. It might become apparent, for example, that changes on characteristic Y would produce more improvement than changes on the other two. If other students' behaviors were also plotted in the diagram of Figure 1, some of them might be closer to H or farther from it, and some might even lie on the other side of H from L. Thus it appears that, in order to reach the same point H, different students may need to change not only in varying degrees, but even in opposite directions. One teacher may, perhaps, need to go up on dimension Y while another needs to come down.

Let us now turn to the problem of what is meant by teacher effectiveness. Teacher effectiveness must be defined, not in terms of teacher behavior, but in terms of effects on pupils. A particular criterion of teacher effectiveness will specify the effects to be produced (objectives), a population of pupils upon whom they are to be produced, and a set of situations in which the effects are to be produced. There will be not one but many different kinds of teacher effectiveness, then, and a particular teacher may be much more effective in one sense than in another.

Suppose that we agree for the present on one particular kind of effectiveness as the one we are trying to produce. Then it is theoretically possible to rank any set of teachers in order of effectiveness from highest to lowest. Suppose that we have done this, that teachers H and L are two of the teachers in our set or population of teachers, and that H is the most effective and L the least effective of the teachers in the population. This would justify our taking the pattern of behavior represented by point H as a specification of the behavioral objectives of our training program, and teacher H would be ready for graduation.

Teacher L, on the other hand, would need to change his behavior (as we have already suggested) and the line LH would indicate the direction of change.

The crucial question is, where do the rest of the teachers in our population fall? Suppose we were to plot the position of another teacher whose effectiveness was about halfway between those of teachers L and H. Where would his behavior be plotted? Would it lie on the line LH somewhere near the center? Most theory and research in teacher effectiveness has tended to assume that it would lie on or near the center of line LH; and that, in general, if all of a population of teachers were located in the space, they would tend to line up in order of their effectiveness. One implication of this that is important to us is the implication that any teacher who wishes to change his behavior in such a way as to increase his effectiveness (as defined) must change it to resemble that of teacher H more closely.

It would be very convenient both for research and for teacher education if all of the behavior patterns of all of the teachers did fall along line

LH , with more effective teachers tending to be closer to H and less effective ones closer to L . The linear models used in research would be appropriate to such a situation; and the procedures needed for training different teachers would be similar, differing in the amount rather than kind of change needed.

I am afraid that the situation is probably very different. If all of the teachers' behavior patterns were plotted in the space, and a line then drawn from the "best" teacher (H) to the next-best, then to the third-best, and so on, ending at the "poorest" (L), the line would not run straight from L to H but would zigzag all over the space. Research designed to interrelate behavior and effectiveness would tend to yield low and conflicting correlations. Attempts to get all of a group of teachers to adopt the same pattern of "effective" behavior would produce relatively little average improvement; some teachers would even get worse. Does this sound familiar? Of course it does, because this is exactly what our experience has been.

Suppose that we plot only the points representing (say) the most effective 10% of the teachers in the population, and leave the rest out. If the classical model were even approximately correct, we would expect these points to cluster in a relatively small region around point H . I suggest that we are more likely to find them clustering in two or more different regions of the space, with each region representing a behavior pattern that some teachers have found to be highly effective. These regions may be quite far from one another, representing quite different teaching styles which are approximately equal in effectiveness.

If we now plot the remaining 90% of the teachers, chances are that each point will be relatively nearer to one effective region than to any other. This would suggest that we ought to identify quite different behavioral goals for different teachers selecting for each one the style nearest where he is as his goal. This would make it possible to produce greater increases in effectiveness with less change in behavior (and hence less effort) than would be required if a single set of behavioral goals were adopted for all students. Even when the goal of a teacher education program is to produce teachers all of whom are effective in the same sense, then, the behavioral goals for individual students may need to be quite different. The implications for designing a teacher education program are obvious. Such a state of affairs also points to a different strategy for research in teacher effectiveness, based not on a search for a single optimal behavior pattern for producing maximum effectiveness, but on an attempt to discover several distinct teaching styles, each of which is just about as effective as any of the others.

We have so far considered only one criterion of effectiveness. If there are different kinds of effectiveness to be developed in a program (if we wish to produce teachers of different subjects, or teachers who will be effective with pupils of different sexes, ages, cultural backgrounds, etc.) there is no reason to expect that the same behavior patterns will be highest on all of the dimensions of effectiveness that interest us, although some of them may. The research question now becomes that of finding which teaching styles go with which effectiveness criteria.

If consideration is given to each student's present or natural behavior pattern, the kind of teacher he wishes to be, and the situations in which he may be employed, the problem becomes so complex that we may as well adopt as a working assumption the proposition that the behavioral goals of teacher education are an individual matter. The direction and amount of change that should be produced in each teacher will tend to be unique to him, and few or no generalizations can be made about what constitutes "improvement" in teacher behavior--at least in our present state of ignorance.

Perhaps the picture I have painted is too dark. Maybe there are not quite as many different types of teacher behavior all of which are equally effective as I have imagined. But I am sure that this picture, pessimistic as it is, is closer to the truth than the simplistic model we have used in the past, the model which assumes that for any given definition of effectiveness there is one behavior pattern which is most effective for all teachers. Research has certainly not been able to identify any such pattern and it has certainly tried.

## Implications for Program Design

If we assume, then, that research does not provide any adequate basis for a prescriptive approach to teacher training, for a program designed to tell a teacher how he must behave to be effective with the class he will face in his first year on the job, what kind of training program can we design? If our objective is not to train teachers to behave in certain ways, what is it? I submit that the proper function of the "professional" component in a teacher education program is to prepare each teacher to find out for himself what behaviors are effective for him. We must offer teachers, not solutions to all of the instructional problems they will meet, but ways of solving these problems for themselves. We must produce teachers ready, willing, and able to do their own clinical research; teachers who will look upon teaching, not as a craft in the practice of which a teacher applies rules and recipes, but as a profession in which he is constantly solving new problems for which no recipe exists.

The model teacher education program must provide the teacher with four things:

1. An experimental attitude--a willingness to examine, evaluate, and modify his own teaching behavior throughout his career.

2. Theoretical knowledge--familiarity with all that past experience and research has discovered which might be useful to him.

3. Technical skill--control over the methods, techniques, and media of instruction (including his own behavior), so that he can implement the theoretical knowledge he possesses.

4. Feedback techniques--ability to use objective methods for analyzing teaching behavior and assessing its outcomes, so that he can learn from his experiences.

Let us examine each of these objectives in somewhat greater detail.

Experimental Attitude. The present structure of teacher preparation and utilization tends to foster the idea that teacher competence is a point which most teachers reach at some time in their career. Once a teacher reaches that point, his training is over. He may take a refresher course now and then to learn about recent innovations (such as teaching machines), but these are minor matters. Once a teacher has been awarded tenure, his competence is no longer supposed to be questioned, or to need upgrading. He has arrived.

The new teacher education program should produce a new kind of teacher, a teacher who looks upon his skill as something dynamic, something like a plant which dies when it stops growing. A teacher who looks upon teacher behaviors and effectiveness in terms of the model proposed above will not think that when he graduates from his pre-service course his training is over. He will go into his first teaching position with the expectation of learning at least as much during his first year in service as he has learned during each year of pre-service training. He will view his teaching certificate as a license to practice, rather than as a release from any obligation to learn. He will look upon the achievement of permanent tenure as a recognition of past progress and as admission to advanced study. He will be a true professional.

Theoretical Knowledge. Much of the content of didactic instruction in present-day teacher education can continue to function in the new program as a means to the achievement of this objective. But the attitude toward this material will be very different. Results of laboratory studies in learning theory, for example, may still be taught to teacher education students. But instead of presenting generalizations about classroom behavior extrapolated from these studies as established principles that teachers can depend on, such generalizations will be presented as hypotheses about classroom learning which the teacher may wish to try out as possible solutions to teaching problems he encounters. The teacher with a solid and comprehensive theoretical background may be expected to deal more effectively with novel problems that come up while he is teaching than a teacher who lacks such training, because he will have better ideas about what to try--will be more creative in his classroom behavior.

Technical Skill. When a teacher confronts a teaching problem and his theoretical training or past experience suggest a particular course of action, it is essential that he be able to implement it, whatever it may be. His training must, as far as is possible, help him learn to use all of the technological aids, teaching materials, and instructional methods in the modern teaching collection; it must also help him develop those skills commonly referred to as teaching skills--the ability to interact effectively with pupils, to manage a class, to explain, ask questions, conduct discussions, and so on. These skills and techniques will be viewed as tools of the trade, all of which he knows how to operate and from which he can select at will the one he thinks will be most effective in a given instance.

Feedback Techniques. The teacher must also learn techniques for assessing what is happening to pupils--must know how to administer and interpret standardized tests and to build tests of his own--as well as how to use less formal procedures for observing pupils. He must be able to find out how effective he is from day to day and hour to hour. He must also be able to monitor his own behavior--to use some of the interaction analysis systems, for example--so that when his behavior is effective he will understand what he did well enough to be able to do it again when he wishes to do so.

It should be clear that all of these objectives are closely interrelated--that achievement of any one will affect and be affected by the achievement of the others. Possession of a full range of technical skills will free a teacher to try new things. A broad theoretical training will suggest more things to try. Ability to obtain objective and accurate feedback about what happens will enable the teacher to profit from such experiments. And all three will strengthen his willingness to experiment, will build the experimental attitude identified as the first objective of teacher education. And if and when research makes available to him new information about what is likely to work for him when he faces a particular problem, the teacher will be ready, even eager, to try it out.

## Implications for Research and Evaluation

Nowhere is it more important to maintain the distinction between teacher behavior and teacher effectiveness than when considering the problem of evaluation. The ultimate objective of any teacher education program must be to produce effective teachers, and must therefore be measured in terms of what happens to pupils. The intermediate goal of any teacher education program must be to produce teachers with certain characteristics, and must be measured in terms of what teachers do. When we wish to evaluate a program, then, we must confront the question, how effective are its graduates in the classroom? When we wish to evaluate a student, we must ask, what effect is our program having on his behavior?

If a student achieves all of the goals of the program to a high degree--develops an experimental attitude, acquires a broad and rich knowledge of pedagogical theory, acquires adequate skill in both conducting learning experiences and in evaluating their effects--and then fails as a teacher, it is the program that has failed, not the student.

As a student passes through the program there will be numerous occasions on which he will be evaluated, for diagnostic purposes, for measurement of progress, for feedback in supervision. Many of these evaluations will and should be based on his behavior in laboratory, clinical, internship, and induction teaching situations, and will involve comparing what he does with what he is trying to do. To the extent that the teacher is able to control his own behavior, the evaluation will be positive. The effects his behavior has on the pupils with whom he is working are irrelevant to the evaluation of the teacher.

This does not mean that data about his effects on pupils should not be collected, however. In each instance in which the behavior of a teacher is measured while he is trying to affect pupils, the effects on the pupils (and other relevant variables, such as student characteristics and situational factors) should also be measured.

Such data should be collected, first of all, for feedback to the teacher, so that, in addition to learning how successful he has been in implementing the behavior he has tried to exercise, he may also gain information about the effects this way of behaving has on pupils. Later on, when the teacher is on his own, he must continue to collect this kind of information, since the contribution of experience to his competence depends on its telling him something about the relationship between his behavior and its effects on pupils.

The same data will also serve another purpose. If the student's progress is to be evaluated, this should be, as we have seen, based on his own behavior. But the information obtained about its effects on pupils can be used to evaluate and improve the program of training. If students who are learning to exhibit the behaviors we recommend are achieving the effects on pupils they are supposed to achieve, our program is effective in some degree in achieving its ultimate goal of producing effective teachers. If students who are learning to exhibit these behaviors are not having the intended affects on pupils, something is wrong with our program. Our recommendations are not sound; the behavior does not do what it is supposed to do. Since the information relates specific behaviors to specific effects, it is diagnostic.

These same data may also serve a third important function by providing research data of value to teacher education as a whole. The accumulation of data relating specific teacher behaviors to specific outcomes under measured conditions in various institutions over a period of time should build up a much-needed stock of information. Gradually we would accumulate more and more knowledge about which teacher behaviors have which effects on which pupils in which situation. Such data would soon enable us to weed out from the theoretical content of the program those extrapolations which do not work, as well as shedding light on those which do, indicating which ones do have validity, for what purposes, and under what conditions.

It seems to me that this line of reasoning points to a research strategy quite different from anything we find in past or present teacher education programs. It appears that research, evaluation, and what might be called the teacher's own clinical experience, can all merge into a single operation which has the potential of achieving the functions of all three--development of research knowledge, provision of continuous diagnostic feedback to the program, and facilitation of teacher self-improvement at both the pre-service and in-service levels--much more effectively than any present structure does or could possibly do.

No function performs itself, no operation is performed without an operator. If this process is to go on, someone must be responsible for it. Someone must manage the collection, collation, and dissemination of this information. This person would have to be a member of the program staff with close contact and rapport with faculty, students, and school personnel, and something more. Not primarily a research type person, although he would need considerable competence in research methodology, he would be a key person in ensuring that all three functions met in their common goal of improving teaching, and in preventing any of the information being gathered from inappropriate use or interpretation.

One final suggestion. If a research enterprise of this nature is contemplated, early consideration should be given to the possibility of storing all of the information in a computer-based data bank with access through objectives, behaviors, pupil variables, and situations, so that ultimately it would be possible to query the system in a number of ways. A teacher might ask what behaviors had been found effective in achieving goal X with pupils of type Y in situation Z , for example, and receive a printout summarizing all experience relevant to that problem reported to date. A teacher educator might request information related to the effectiveness of a particular strategy for training teachers, or for the most effective strategy for a particular purpose.

## Concluding Remarks

If I had to sum up the relationship between research and teacher education in one sentence, I would say that the teacher educator should ask, not what research can do for teacher education, but what teacher education can do for research. Past research has developed so little knowledge of the nature of effective teaching that I have had to propose a model for teacher education which does not assume the existence of any such knowledge at all.

The program for training teachers based on the model I have described above is designed primarily to prepare each graduate to discover for himself what style or strategy is effective for him in his own situation.

I have also suggested that a feedback system be incorporated in the program that will use the experiences of teachers trained in it to develop bit by bit the understanding of the teaching-learning process research has so far failed to provide. As such knowledge accumulates, the amount of help the program can give its students in their search for effectiveness should increase, and it is in this process that all our hope of ever developing a viable theory of teaching lies.

Once more I say that teacher education should not look to research in teaching for help in training teachers; on the contrary, research must look to teacher education for help in developing a science of teacher behavior as a byproduct of the process of teacher education.

## Development of Behavioral Objectives.

The preparation of behavioral objectives was a crucial step in the progression from general goals of teacher education to the end product of particular educational specifications. The preparation of behavioral objectives was a task made necessary by the early decision to design a program which could be evaluated--one with goals which could be evaluated by observable, measurable changes in behavior. The behavioral objectives make this possible and serve as the basis for structuring educational specifications.

The writing of the behavioral objectives was principally carried out by EVCO Basic Instructional Research Design, Albuquerque, New Mexico with assistance from the project staff and selected consultants. EVCO was selected for this task because of its considerable experience in this field and similar work it had done for IBM, U. S. Forestry Service, U. S. Navy, and other organizations. EVCO's basic work for this project was done under the direction of Dr. James L. Evans with the principal assistance of Mr. Richard L. Yaple. The project staff and various consultants worked closely with EVCO in the development of the behavioral objectives. This effort resulted in a series of meetings in Albuquerque which began in April and ended in June, 1968. Input to EVCO for the writing of the behavioral objectives came from these meetings, source materials supplied by the project staff and EVCO, and the original project proposal. Two meetings were also held with the university members of the Ohio State Universities' Consortium for purposes of explanation and to secure suggestions for furthering the activities of the project. The first meeting was held April 8, 1968 in Cleveland and the second May 9, 1968 in Columbus. At the latter meeting, Dr. James Evans reviewed the process being organized to develop the behavioral objectives. At this meeting representatives of public school systems who were cooperating with each university attended for the first time.

Mager[16] has suggested that three questions must be asked before behavioral objectives are written:

1. What will the student (teacher) be doing when he is demonstrating proficiency?
2. Under what conditions will this behavior occur?
3. What is the level of acceptable performance?

Attempts to answer these questions first led the project staff to a broad consideration of teacher behaviors as revealed in recent clinical studies of teaching. These studies offer the opportunity to make laboratory experiences and direct studies of teaching systematic, as they provide us with ways of ordering various components of teaching and ways of understanding them. In this regard Flanders has stated:

> "Teacher education will become increasingly concerned with the process of teaching itself during the next few decades. Instead of emphasizing knowledge which we think teachers will need in order to

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[16] R. F. Mager, Preparing Instructional Objectives, San Francisco: Fearon Publishers, 1962.

> teach effectively, as we have in the past, we will turn more and more to an analysis of teaching acts as they occur in spontaneous classroom interaction."[17]

Such research has been designed to develop classifications of teaching behavior for better understanding of the phenomenon.

LaGrone[18] has provided a classification of teacher behaviors into twelve categories each of which can be broken into numerous specific teacher behaviors.

1. Behaviors related to teaching activities (e.g., defining, describing, directing).
2. Behaviors as pedagogical moves or phasing (e.g., reacting, lifting, structuring).
3. Behaviors related to learning processes (e.g., motivation producing, response eliciting, drawing inference from data).
4. Information processing behaviors (e.g., sensing, identifying, and classifying information inputs).
5. Influence behaviors (e.g., lecturing, accepting and clarifying feelings, praising and encouraging).
6. Controlling behaviors (e.g., structuring, regulating, judging).
7. Positive and negative affective behaviors (e.g., supportive, encouraging, admonishing).
8. Response behaviors (e.g., meeting requests, ignoring, interpreting).
9. Communicative behaviors (e.g., verbal, non-verbal, direct, non-direct).
10. Out-of-class instructional related behaviors (e.g., planning and organizing, selecting media and materials, determining and stating behavioral objectives).
11. Behaviors related to personal characteristics (e.g., democratic, autocratic, forceful).
12. Out-of-class school oriented behaviors (e.g., cooperating, supporting, interpreting).

LaGrone further indicated that these behaviors can be demonstrated and the competencies of the prospective teacher can be evaluated by:

1. problem solving or testing,
2. simulation techniques,
3. specific direct classroom experiences.

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[17] Ned A. Flanders, "Intent, Action, and Feedback: A Preparation for Teaching," Journal of Teacher Education, 14:260, September 1963.

[18] Herbert F. LaGrone, A Proposal for the Revision of a Pre-Service Professional Component of a Program of Teacher Education, Washington, D. C.: American Association of Colleges for Teacher Education, 1964.

The studies on teacher behavior clearly indicated that knowledge about teaching is being produced in a form which is specific yet able to support generalizations. Further, this knowledge can be translated into skills through appropriate experiences which are directly related to classroom experience. Current research demonstrates that prospective teachers must become active participants in the analysis of their teaching behaviors through such means as interaction analysis, microteaching, simulation experiences, and videotapes. Prospective teachers should be able to demonstrate their competence in a number of behaviors, evaluate the effectiveness of their performance, and use the information to plan further professional growth.

The professional literature provided EVCO and the project staff with general guidelines for the production of behavioral objectives. Research findings were not, however, as relevant to the specific generation of behavioral objectives as was thought possible in the original conception of the process. (The original conceptual design of the project envisioned a development of teacher behaviors prior to creating behavioral objectives.) Rather, a general analysis and review of teacher behavior pointed up the need for two considerations in our further efforts. First, as indicated in the preceding paragraph, certain teacher education experiences must utilize various methods of teacher behavior analysis. Second, unless the developer of behavioral objectives has the opportunity to assess individually and carefully, the behavior of the definite target population for which objectives will be written, relatively little useful specific information will be forthcoming from general reviews of teacher behavior from so-called representative teacher populations for the development of behavioral objectives. The project staff did not have the time or resources to assess the teaching behavior of appropriate sample populations. Further, the "behaviors" of each of the six target populations named in the project obviously differed from each other and, for the most part, have not been conclusively catalogued by research. Teaching continues to be an individual matter and the behavior of one teacher or a group of teachers is not necessarily the behavior of others.

What did appear useful to EVCO and the project staff in the process for organizing and generating behavioral objectives were the five specific contexts considered (including position papers and reactions) and the eight components for which educational specifications were to be developed. The eight original proposal components were: selection criteria, content mastery, general education, professional education, continuing education, teachers (in-service), college and university personnel, and administrative and supportive personnel.

The five contexts have been discussed previously but the eight components need further explanation. It was recognized that behavioral objectives were to be produced for target populations and that the listing of the eight components contained a mixture of target populations and aspects of a comprehensive teacher education program most concerned with the one particular target population designated as "pre-service teacher." In other words, selection criteria, content mastery, general education, professional education and continuing education were certainly factors in any program to prepare prospective teachers and, clearly, some of these same factors were also important in any retraining efforts with teachers (in-service), college and university personnel, and administrative and supportive personnel. Consequently, the first five components relating to the pre-service (prospective) teacher population were included within that population in the development of behavioral objectives. Consideration was also given to these components in other populations when applicable.

This decision concerning the original eight components left four basic target populations for which behavioral objectives would be formulated: pre-service teachers, in-service teachers, college and university personnel, and administrative and supportive personnel. Later in the project the first and last of these target populations were further sub-divided into four distinct targets. Pre-service teachers became pre-service teachers--pre-school-kindergarten and pre-service teachers--elementary (grades 1-8). Administrative and supportive personnel became administrative personnel (principals and supervisors) and supportive personnel (para-professionals and aides). Behavioral objectives and educational specifications were ultimately created for six target populations.

A 5 x 4 matrix of the five contexts and the four basic target populations was then conceived as a guide for creating of behavioral objectives for each of 20 cells. A process was then organized for completing the task of accommodating each cell. The process called for each context area to be first divided into the major subjects which needed consideration. Each subject, in turn, was further subdivided into topics. For each subject and topic a list of relevant source materials was compiled. Finally, a list of suggestive teacher behaviors (what we wanted the target population to be able to do) was provided for each target population considered in each topic for every subject. From such information and utilizing this process, behavioral objectives were created.

When EVCO had completed its "first cut" of the objectives, they were reviewed by the project staff, selected members of the Steering Committee, and certain consultants. Each representative of the Consortium also had an opportunity to see the objectives. An assistant project director visited each university in the Consortium to meet with deans and interested faculty for review and consultation. Following these reviews, EVCO was supplied with criticisms and suggestions for producing the final draft of the behavioral objectives. It was at this point that the four target populations were expanded to the final six. Also, additional behavioral objectives were produced by members of the project staff and consultants.

A total of 2,123 behavioral objectives were received from EVCO and other persons working on the project. In the course of reviews and revisions 1,411 behavioral objectives were ultimately selected for further consideration and inclusion in the process of developing the educational specifications. Chapter III in Volume II of this report contains these objectives for each context as part of the educational specifications.

## Development of Educational Specifications.

The product of the entire process carried forth in this project was the creation of a large number of educational specifications. These specifications cover a wide spectrum of topics and relate to six target populations. They are grouped according to the five contexts used in the project which are further subdivided into subject areas and topics. These contexts provide an effective frame of reference against which to order, present and list educational specifications. Chapter III in Volume II contains 818 educational specifications. The chapter also contains a review of the factors which were involved in the production of the educational specifications including the underlying assumptions upon which they were based.

Each educational specification contains the behavioral objective or objectives to be considered, the treatment (methods and activities) desired to achieve the objective(s), the educational materials needed for the treatment, and the appropriate evaluation technique(s) necessary to determine if the behavioral objective(s) is/are achieved. All of this is related in each specification to a particular context, subject, topic, and target population.

The educational specifications were written by members of the project staff, personnel from the Wisconsin R & D Center, MOREL (Regional Laboratory) staff, EVCO, faculty from the Consortium, and consultants. A MANUAL FOR SPECIFICATION WRITERS was developed and provided to each specification writer to help insure consistency in the form of specification development but not to inhibit individual creative response to the assignment.

The finished educational specifications were coded by the project staff using a coding system for each of the four major parts of a specification. This system is reproduced in Volume II with a discussion of the process. The coding made possible the utilization of computer equipment in the process of developing composite specifications and was instrumental in creating the process itself.

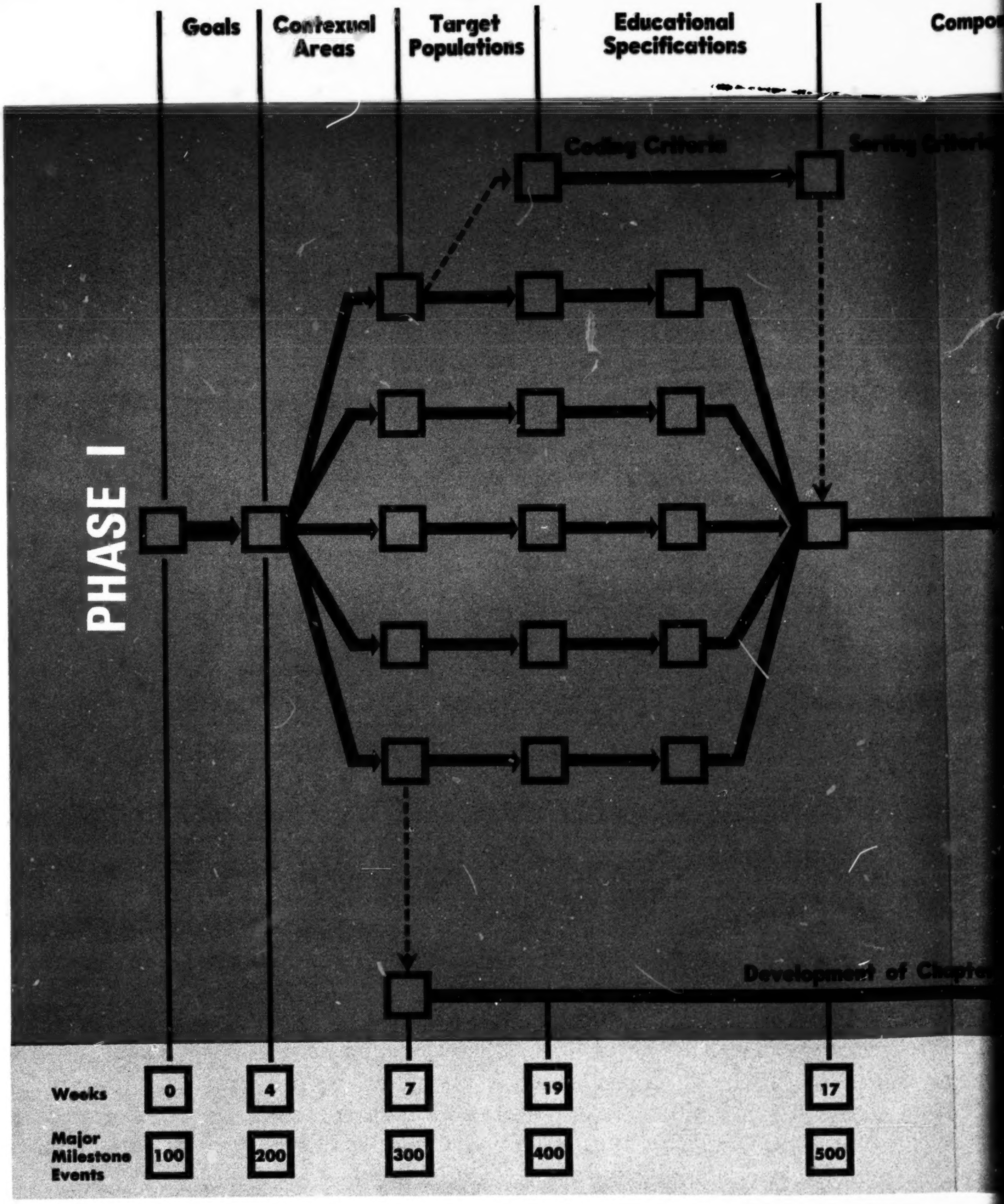
## Management and Evaluation of the Development of Specifications.

Project planning and control was guided by the Program Evaluation Review Technique (PERT). Dr. Desmond Cook of Ohio State University prepared the Summary PERT Network which was contained in the original project proposal. This summary network presented the major milestone events, the major project elements, and the supporting contextual series. Figure 6 is a final updating of this original summary network to show the major events and activities involved in the project.

All PERT activities were provided by PERT consultants from Ohio State University. A PERT consultant was assigned to the project and communicated regularly with the project administrative assistant relative to the progress made at certain intervals. The PERT network summary was thus redrawn frequently to keep the network current. "Perting" aided the project staff in its tightly scheduled efforts to complete the project.

The various levels of Figure 2, with the exception of the second level, in essence represent outcomes at various points in the process of developing specifications. The final outcome is the set of composite specifications on which to base model teacher education programs. The obvious criterion of evaluation of the specifications before they are actually applied to an operational program is the extent to which the specifications reflect or are designed to meet the original goals of teacher education. This relating of specifications back to goals makes a closed system of the components of Figure 2. Essentially, what this requires is a degree of internal consistency between the various components of Figure 2 (as represented by the lines) so that the specifications do relate adequately, on the basis of logical construct, to the goals. The project staff believe that the speci-

# TEACHER EDUCATION — Summary


Goals
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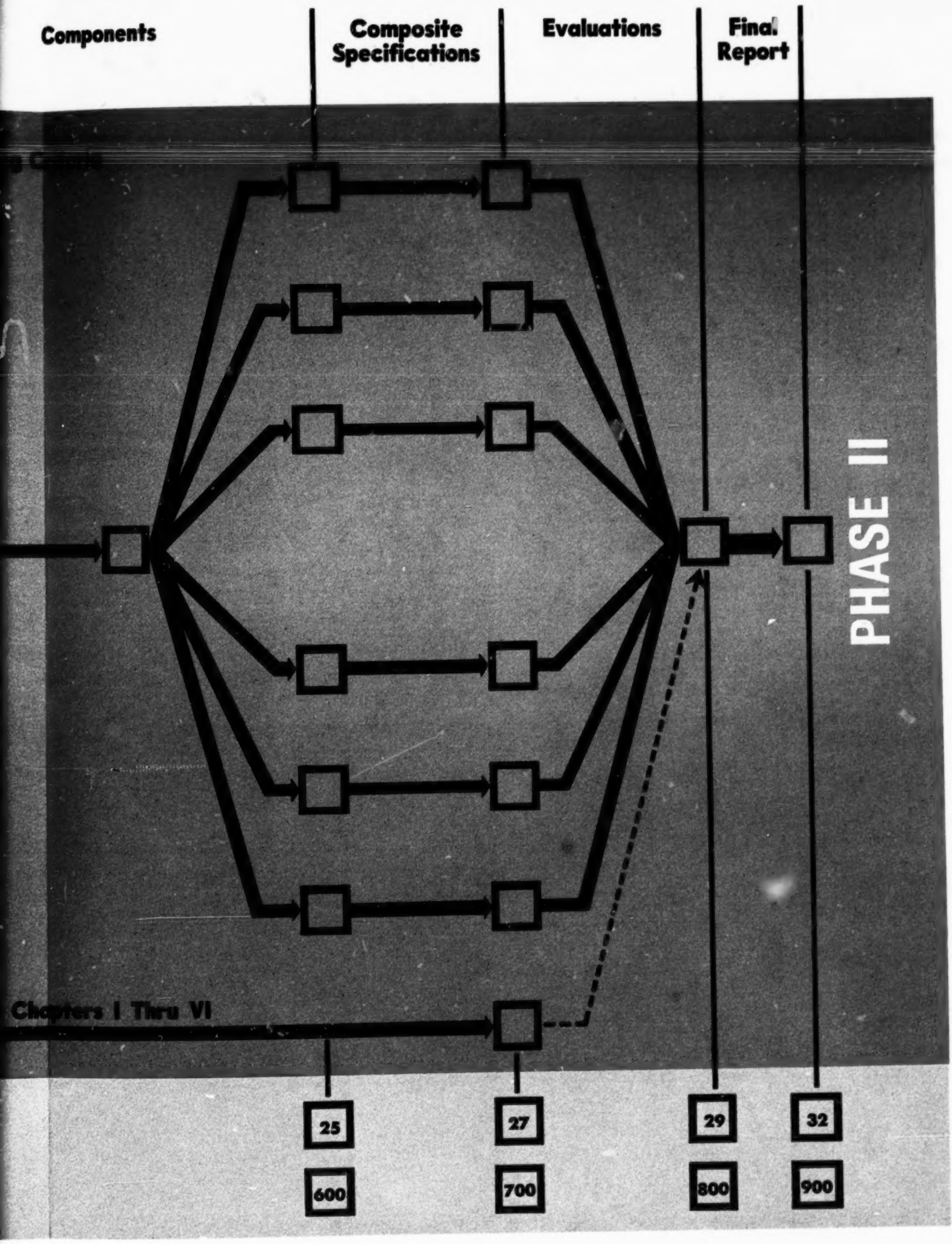
4
7
19
17
Major Milestone Events
100
200
300
400
500

Figure 6

# mary Milestone Network – Phase II


Components
Composite Specifications
Evaluations
Final Report
PHASE II
Chapters I Thru VI
25
600
27
700
29
800
32
900

fications do so relate in a logical manner. The empirical evaluation of the specifications will be a long-term process which must await their implementation in model programs. Suggestions for this evaluation system are proposed in Chapter V.

# Chapter III

# THE SPECIFICATIONS

This chapter contains a major portion of the tangible results of the project effort discussed in Chapters I and II--a list of 818 educational specifications. Because of the obvious difficulty of handling a chapter containing this number of specifications in a single volume, the educational specifications are published separately from Volume I as Volume II. Volume II, therefore, becomes Chapter III of the total report and is both *part* and *whole* of that report. It is only part of the entire project report, but it is a complete compilation of the specifications sought by the project staff representing the consortium. For those readers who wish to peruse Volume I before turning to Volume II, certain information which appears in Volume II needs to be repeated so as to provide the report continuity necessary for examining the remaining chapters of Volume I.

## Assumptions for a Program of Teacher Education Utilizing The Specifications

Certain assumptions supported the 818 specifications and helped direct the project staff of the consortium throughout the process of designing specifications for a program of teacher education. They are implicit throughout the complete report, but they need to be made explicit at this point in order to serve as a frame of reference for the remaining chapters in Volume I and the specifications appearing in Volume II.

An initial assumption was that five conditions of life and education were of major importance and must be considered as the formulation of a program of teacher education. These conditions named "contexts" were:

1. instructional organization,
2. educational technology,
3. contemporary learning-teaching process,
4. societal factors, and
5. research.

The first assumption, that the five contexts must be considered, led to the formulation of additional assumptions as each context was studied in its turn. To illustrate this interrelatedness we begin with the first of the "contexts" and consider each in order.

*Instructional Organization*. Any teacher education program based on the specifications secured in this fashion would be orientated to training teachers for a team teaching type of instructional organization. Specifically, the team teaching instructional organization will be designed on the basis of the Research and Instruction Unit (R & I Unit) organization for teaching in a multiunit school. This conception of team teaching was developed by The Wisconsin Research and Development Center for Cognitive Learning. The basic assumption here is that if teachers are going to teach in multi-unit organizations, they should receive their corresponding training in connection with this type of organization. The training program also assumes that instruction in the elementary school will not be limited to traditional group activities but that individually guided education or a program of individualization will be developed, and that it is essential for the teacher to have proficiency in dealing with such programs. Relative to this, not only is it assumed that teachers will be prepared to provide individually guided education for elementary school pupils, but also that there is a system of individually guided education in the teacher education program, especially those portions dealing with pre-service and in-service populations.

Educational Technology. Another assumption is that the development of technology, specifically as related to education, will have a major impact upon teaching in the elementary school. Therefore, it is necessary to train teachers accordingly. In too many elementary school classrooms there has been insufficient use of the products of educational technology, but this is changing. Through the use of videotape and educational television, the technique called microteaching for developing teaching skills and teacher self-analysis has been created. Another consideration among many related to technology, is that the computer will find increasingly more usage in the elementary classroom, and that teachers should have facility in dealing with computer assisted instruction. Whether or not within a very few years substantial numbers of teachers will, in fact, be heavily involved in computer assisted instruction is irrelevant for the purposes of the specifications. The basic assumption here is that computer assisted instruction, which may take various forms, will be a major force in the elementary school. It merits attention in any teacher education program.

Contemporary Learning-Teaching Process. The assumption related to the learning-teaching process is that there now exists a great deal of information about the learning process that is not being effectively incorporated into teacher education programs. The approach used in developing the collection of specifications is behavioral in orientation. What this does is put the emphasis upon the outcome, behavior, and the overt operational procedures and techniques by which a specific behavior can be elicited. Any teacher education program based on these specifications would have this orientation.

Societal Factors. Another assumption underlying the specifications is that each teacher must be keenly aware of cultural differences which may be external to but, nonetheless, have an effect upon the educational setting. The generally traditional approach of training all teachers with a single, middle class, highly structured orientation to the learner is no longer feasible in a multi-cultural and dynamic society. Therefore, the specifications put considerable emphasis on preparing the teacher to deal with cultural and societal factors which are extraneous to the usual classroom learning situation.

Research. The identification of research as a context by itself was motivated by the assumption that if teacher education as a field and teacher education programs specifically are to be viable, dynamic and effective, it is necessary that research findings and techniques be utilized both in the program and by the teacher after completing the program. Rather than a traditional, *a priori* approach to teaching and teacher education, the specifications reflect a more empirical and research oriented approach. A teacher educator who operationally ignores research findings would be out-of-place within a program based on these specifications.

Multi-activity Program. The preceding assumptions are related specifically to the five contexts mentioned earlier. Other assumptions also underlie the specifications. For example, the reader will find very little reference to specific course work in the specifications. This does not mean that the teacher education program based on the specifications would be completely lacking in course work. It does, however, mean that the basic approach to training teachers will be through a multi-activity type program. It is assumed that the teacher will find a variety of experiences in the training program, and as model programs are developed, certain specifications might be met in more than one way. Essentially a work-study, practicum-experience, content-training, combination approach underlies the specifications. Any part or component of a model program based on the specifications would be included in the program for a definite functional or content reason.

Public School Involvement. Another assumption relative to the basic approach to training teachers is that there will be considerable involvement of the public schools as the physical facility for a substantial part of the training. The specifications cannot be operationally implemented by a university or college with no public (or private) elementary school involvement. The assumption is that public schools and universities can put forth a cooperative and coordinated effort. To some extent this approach would parallel present cooperation between medical schools and selected hospitals in the training of medical doctors.

In-service Programs Needed. The question might be raised, "Who is assumed to be qualified to participate in programs developed from these specifications?" Specific selection criteria might apply for entrance in pre-service programs and those for teacher aides. The basic assumption for in-service programs of any type, including those for administrators, is that they are applicable to the present populations. For example, the one qualification for participation in an in-service program is to be a certified teacher or administrator. This does not mean that selective retention and dropout are precluded after entry to a program. Each program will have its own inherent requirements to be met, as established by the implementing institution.

College and University Personnel Involved. Some general assumptions also exist relative to the college and university personnel who will be involved in the preparation of teachers. One is that present staffs must serve as a starting point, but that considerable re-education and additional training will be necessary for many. Considerably more specialists in research and development and technology will be required as implementation of programs becomes more extensive. Traditional departmental organizations and within-college structure may require modification. We are assuming that the program should have an operational structure fitted to it, not that the program should be adjusted to present structures if the recommended structure introduces extensive problems.

Specifications were not developed for training specialists such as subject area supervisors and guidance counselors. The assumption is that such programs are best considered in the realm of graduate work leading to advanced degrees. No assumptions about the acquisition of advanced degrees are included in these specifications. If an implementing institution decided that a particular program as based on these specifications, met the requirements for an advanced degree, it could offer such a degree at its option. It is assumed that the teacher would participate in a program of continuing education after entry into the teaching profession. Such continuing education would be dictated by the needs at that time and would undoubtedly undergo continuous revision with the passing of time.

Length of Programs. The length of teacher education programs based on these specifications could vary considerably with the type and implementation of the program. However, it is assumed that the present structure could be used as a starting point. For example, for purposes of initial implementation, the specifications for pre-service teacher candidates could be put into a four-year program. However, an institution might want to deviate from traditional time schedules; such flexibility is assumed for the specifications. It is further assumed that the length of time any candidate remains in a program based on these specifications is totally dependent on the individual capacity and ability of the individual to meet the requirements of the program.

Feedback and Change. Finally, it is assumed that these specifications are not "forever" the last word in teacher training. The procedures for implementing specifications will include a self-correcting and "bringing-up-to-date" aspect so that teacher education can become a changing instead of a static process. Not a process which changes for the sake of change but for program improvement. As an assumption with immediate application, it is assumed that the reader will consider the specifications with these assumptions in mind.

## The Specifications

The specifications appearing in Volume II are the result of a carefully planned process which has been previously described. Each specification consists of an objective or objectives together with the treatment suggested to accomplish the objective, the materials required, and a description of how to evaluate the accomplishment of the objective. A specification concerns itself with a plan or method of carrying out or implementing a behavioral objective or related group of objectives.

The precise elements of each specification follow in the order in which they appear in the specification:

(1) Behavioral Objectives:

Context:

Major Subject Area:

Topic:

Target Population: (Any of the six target populations previously indicated)

Behavioral Objectives: (One or more)

(2) Treatment:

In this section sufficient detail is included so that readers can understand how the objective(s) is/are to be accomplished. Writers were directed to be as brief as possible, consistent with clarity.

(3) Materials:

Both the general type of materials required and a major published source relating to the specifications are supplied.

(4) Evaluation:

The specific evaluation techniques to be employed are indicated.

General Guidelines for Specifications. The following guidelines were furnished to all specifications writers in a manual prepared by the project staff. They are quoted as they appeared in the manual.

> "The educational specifications developed will be examples only, as there are myriad approaches to developing specifications for a behavioral objective and all approaches cannot be specified.
>
> "Each specification developed will be exemplary and subject to further refinement. Each specification will demonstrate that the objective concerned can be accomplished.
>
> "In regard to the amount of detail to be supplied, the idea is not to provide in the specification a broad, general direction nor a highly specific, narrow treatment. Rather, each specification should provide an example of a succinct and consistent approach to the objective which is clear and practicable. Specifics then possible in this project can be left to future program planners.
>
> "Although time is usually considered a part of any educational specification, it need not be indicated by the specification writer. General time modules will be considered for the final models produced from the project. Individual specification writers should keep in mind that each specification developed should be capable of accomplishment within a reasonable time period, usually not to exceed several hours.
>
> "The number of behavioral objectives in the project will be about 2000. The number of educational specifications to be produced could also be as large. Thus, each specification writer is asked to limit each specification, including objective, to not more than a half page, single-spaced. If more than one objective is listed for specification development more than a half page can be utilized.
>
> "The specifications will be coded by the project staff using a coding system for each of the four parts of a specification. The coding system is not as yet complete but the following section (in the Manual for Specification Writers) suggests current staff thinking on the subject for treatment, materials, and evaluation. This information may be helpful to specification writers. A tentative coding system has been prepared. Writers are not restricted to using the terms listed in the code but familiarity with the terms should result in better specification writing. If writers attempt to express themselves, whenever appropriate, in the language of the

code, the time and effort of those coding specifications can be used to best advantage."[19]

Another guideline for specifications which did not appear in the Manual for Specification Writers but was conveyed to those working on specifications concerned the multiple use of behavioral objectives in one specification. An extensive and many-faceted teacher education program which attempts to attain a reasonable measure of comprehensiveness involves a variety of materials, techniques, procedures, and treatments. With this in mind, the development of specifications procedurally followed the axiom that program components took precedence over format. However, the consistency of format was enhanced as much as possible without damaging any potential program. An illustration of this point was the consideration of which behavioral objectives to include in specifications. For the most part, any single behavioral objective appears in only one specification. An exception to this will be observed in the context Instructional Organization, especially in the subject areas dealing with training for instruction and the multi-unit organization. Many of the behavioral objectives in these areas are "long-term" in nature. Meeting such objectives involved different treatments, administered at different times, and designed to meet the same or different combinations of objectives. In order to enhance continuity and avoid program fragmentation, it seemed best to re-use various combinations of the objectives dealing with these areas in particular specifications. The reader will note the occasional multiple use of behavioral objectives for the development of specifications in the context of Instructional Organization.

Recording the Specifications on IBM Cards--Coding. The general guidelines referred to a coding process. The utility of coding is repeatedly demonstrated in the next chapter of the report, but some details of the process must be provided here to aid in the interpretation of the specifications.

The specifications as presented provide a great deal of information. In order to summarize and synthesize information adequately and utilize the specifications for model programs efficiently, it was decided to code the specifications and the information they contain on IBM cards. This made possible the use of a computer to secure quickly the identification of desired specifications as well as to provide summaries of information. In order to secure all the detailed information, it is, of course, necessary to read the entire specification. However, as will be illustrated in Chapter IV, the use of the card deck of specifications is very helpful for the initial steps in securing composite specifications for model programs.

Each specification was recorded on two IBM cards. The information contained on the cards was defined by the following code. (Any columns not listed were blank)

---

[19] Manual For Specification Writers, Toledo, Ohio: Research Foundation, University of Toledo, 1968. (Multilithed)

| Card | Columns | |
|---|---|---|
| 1 | 1-4 | Identifying number of the specification. The first digit indicates the context to which the specification belongs (see the summary of specifications by identifying numbers). |
| 1 | 6 | Number of the card (1 or 2). |
| 1 | 8 | Number of the major subject area within the context. |
| 1 | 9-10 | Number of the topic within the subject area. |
| 1 | 11-16 | Population to which the specification applies--a 1 indicating it applies, a 0 indicates it does not apply. Populations were in the following order: pre-service (elementary), in-service, administrative, supportive, college and university, pre-service (pre-school). |
| 1 | 18-19 | Number of behavioral objectives in the specification. |
| 1 | 21-31 | Treatment, eleven possible types, coded 1 or 0. |
| 1 | 41-54 | Evaluation, 14 possible types, coded 1 or 0. |
| 1 | 61-80 | Materials, coded 1 or 0. |
| 2 | 1-20 | Repeat of information on card 1. |
| 2 | 21-68 | Materials continued giving 68 possible types. |
| 2 | 71-72 | Major source by number from the corresponding bibliography. |

The possible types of treatments, materials, and evaluation techniques which were coded were as follows:

Treatments

1. Cooperative activity (included--planning, developing, evaluating, organizing, consulting, exchanging).

2. Demonstration (included--exhibiting, constructing, modeling, applying, drawing-painting).

3. Direct experience (included--discovery, experimentation, investigation-exploration, micro-teaching, laboratory).

4. Discussion (included--questioning, describing, reciting, panel-symposium).

5. Individual study (included--reading, individual assignment, drill).

6. Observation (included--field trips, video-taping, interviewing, measuring, testing, recording).

7. Simulation (included--contrived experience, role-playing, dramatization, reconstructing).

8. Skill development (included--writing, symbolizing, verbalizing, summarizing, generalizing, operation of equipment).

9. Telling (included--lecture, speech-address, reporting, storytelling).

10. No suggested treatment.

11. Other treatments (not included above).

Materials

1. Audio-visual materials (included--diorama, filmstrip, microfilm-microfiche, mock-up, model, motion picture, pictures, projection equipment-projectors, screen, radio, realia, recording devices, sign, slide, sound equipment, stereograph, tachistoscope, telephone, television, transparency).

2. Books (included--textbooks, non-library reference books, supplementary sources, booklets).

3. Printed materials other than books (included--cartoon, catalogue, diagram, notebook, school publication, source material, workbook).

4. Library materials (included--library book and reference collections, magazines, newspapers, periodicals).

5. Standard multiunit materials (included--bulletin board, chalkboard, chart, drill device, feltboard, globe, graph).

6. Resource materials (included--field trip, museum).

7. Laboratory materials (included--demonstration, display device, dramatic properties, duplicator, exhibit, experiment, game, special purpose laboratory, lettering device, map, object, optical instrument, photography equipment, presentation device, specimen, toy, typewriter).

8. Programmed materials (included--programmed learning device).

9. Computer (included--computer, information storage and retrieval system).

10. Tests (included--test materials).

11. No suggested materials.

12. Other materials.

Evaluation Techniques

1. Conferences.

2. Cumulative records.
3. Demonstration.
4. Examinations--teacher made and standardized.
5. Interviews.
6. Observation.
7. Operation--performance.
8. Questionnaire techniques.
9. Reports--oral and written.
10. Self-appraisal (included rating scales).
11. Socio-metric techniques.
12. Special assignments and exercises.
13. No suggested evaluation techniques.
14. Other evaluation techniques.

## Organization of Specifications

A final task confronting project personnel was the way of ordering educational specifications. They could be presented according to the numerical order of the specifications. They could be grouped and regrouped according to target populations similar to the way they are used in the next chapter. These and other possible systems all had much to commend them. The decision was finally made to present the specifications in Volume II according to the logical development of content in each of the five "contexts." This decision was based on two conditions:

(1) This was similar to the way in which the behavioral objectives were first arranged.

(2) A content arrangement would be more understandable to users of Volume II not yet familiar with the range of capabilities of the specifications.

Accordingly, the specifications are presented in Volume II in five groups, one for each context. Within the groups they are divided into a number of major subject areas. Within each major subject area, they are further subdivided according to the various topics to be considered in the subject area. This is the scheme for presenting the entire collection of specifications.

## Summary

Readers are now familiar with the process for arriving at specifications and with the general contents of a specification. It should be pointed out again that the specification as a whole constitutes an exemplary though not the ideal program. Although the program can stand as an entity, it is not intended to rule out the possible inclusion of other subjects and other topics important to teacher education. It does represent one strategy for making an immediate impact upon all of the principal participants in a program of teacher education. This program represents an attempt to avoid rigidity, to provide prescription with flexibility, and it is not intended that the treatments, materials, and evaluations should remain the same. Hopefully the program should become self-renewing and constantly becoming an outstanding program even though at any one point in time the specifications and associated elements in being should be relevant and effective.

Users of this report are reminded also that there are more means of accomplishing the goals and objectives of the program than could ever be set down in the most comprehensive of specifications and programs. Volumes I and II are an account of one approach which, even as published, are out of date in some respects and in a process of change. John Dewey taught us that the "solution" of one problematic situation only leads to the identification and need to encounter another problem at another level. This is the use to which the specifications and the entire report should contribute.

## Chapter IV

# COMPOSITE SPECIFICATIONS FOR MODEL PROGRAMS

The 818 specifications presented in Volume II appear as a single body of specifications. They provide in essence the population of specifications designed to implement goals and behavioral objectives for the program(s) of teacher education. But, specifications in themselves require one additional process before they can be implemented. This additional process is the identification of composites of specifications which comprise major components of model programs. As will be illustrated in the following sections, the 818 specifications provide an efficient base from which not one, but essentially any number of model programs can be generated. This use of the specifications developed in the project, is viewed by project personnel as one of their most desirable features. That is, the specifications can be used in a prescriptive, flexible manner with wide application.

Readers who have followed this project from the onset will, by this time, be familiar with the ever present problem of maintaining a broad perspective of the whole process in order to accommodate prescription of "a program or programs" with flexibility and constant modification of the elements of such a program or programs. It is at this point in the project that this dilemma is unhorned. We have now assembled the specifications required to attain the objectives and the goals. Clearly, something more must be done to the specifications before we begin to implement the program(s). It is the purpose of this part of the report to suggest a variety of ways in which to order and reorder the specifications and, beyond this, to actually extract from the complete array of specifications those required for the target groups or sub-groups of special importance to project personnel. It is this demonstration which will reveal how we can mix prescription with flexibility and model programs with constant revision.

This section of the report will consist of four parts. We shall first present a process of putting specifications together into groupings that have been named "Composite Specifications for Model Programs." The process will then be demonstrated by application to each of the six target populations of the project. The potential versatility of our process and product will next be suggested by returning to the specifications again to draw out and put together the essentials of a Special Purpose Model Program. A general summary of the elements in the composite programs considered completes the chapter.

## Process for Developing Composite Specifications for Model Programs

The total specifications as presented in Volume II cover a wide spectrum of topics and relate to six target populations. The specifications are grouped according to five contexts divided into subject areas and topics. These contexts provided effective sources for the development of specifications. However, it is unlikely that teacher education programs could be developed according to contexts and rarely would any topic be comprehensive enough for the development of an entire program. For example, we would not expect to develop a program for any one of the topics within societal factors and view this as a complete, composite entity in itself. The composite specifications for model programs can be identified using any number of possible criteria to guide the selection of relevant specifications from any context and any subject or topic.

What comprises the composite specifications for a model program? A model program for the purposes of this project is defined by the following criteria:

(1) directed specifically toward one (or more) target population(s),
(2) based on a set of well-defined goals,
(3) designed to meet the goals as a self-contained entity regardless of duration, and
(4) described operationally from the specifications it encompasses.

In order to develop model programs utilizing the specifications of Volume II, certain assumptions will be observed. The total of specifications comprises example specifications for the various context, subject area, topic, and target population breakdowns. These specifications do not comprise a sample. That is, we did not have a larger population of specifications from which we selected a subset or sample. However, since educational specifications mean different things to different people, it is entirely possible that other specification writers would come up with different specifications, even different formats, to meet the same or other objectives. Thus, the specifications for the model programs which follow, might be viewed as an example set of specifications.

Another sense in which the specifications comprise examples is that they do not cover every possible program in teacher education that could be developed, but only programs within the bounds of the project as discussed earlier. Within these bounds, it is assumed that several model programs of varying magnitude could be identified. The composite specifications for such model programs would be adequate to define the program. "Varying magnitude" may be illustrated by examples. We might be interested in the entire composite specifications for a pre-service program of several years. As another example, we might want a model program for preparing in-service teachers for conducting research in the instructional setting of R & I Units. Such a program might take the form of an eight week summer institute with continuing in-service training during one academic year.

The process for developing composite specifications for model programs is diagrammed in Figure 7. In order to begin the process it is assumed that the target population(s) for the program can be specified, and a description of the goals of the program or the needs it is to meet can be expressed in, at least, general terms.

The various steps of Figure 7 identify the activities necessary for the process of developing composite specifications. This might be viewed as a general process; however, it is a specific process developed for utilizing the specifications of this project. A description of the various steps now follows.

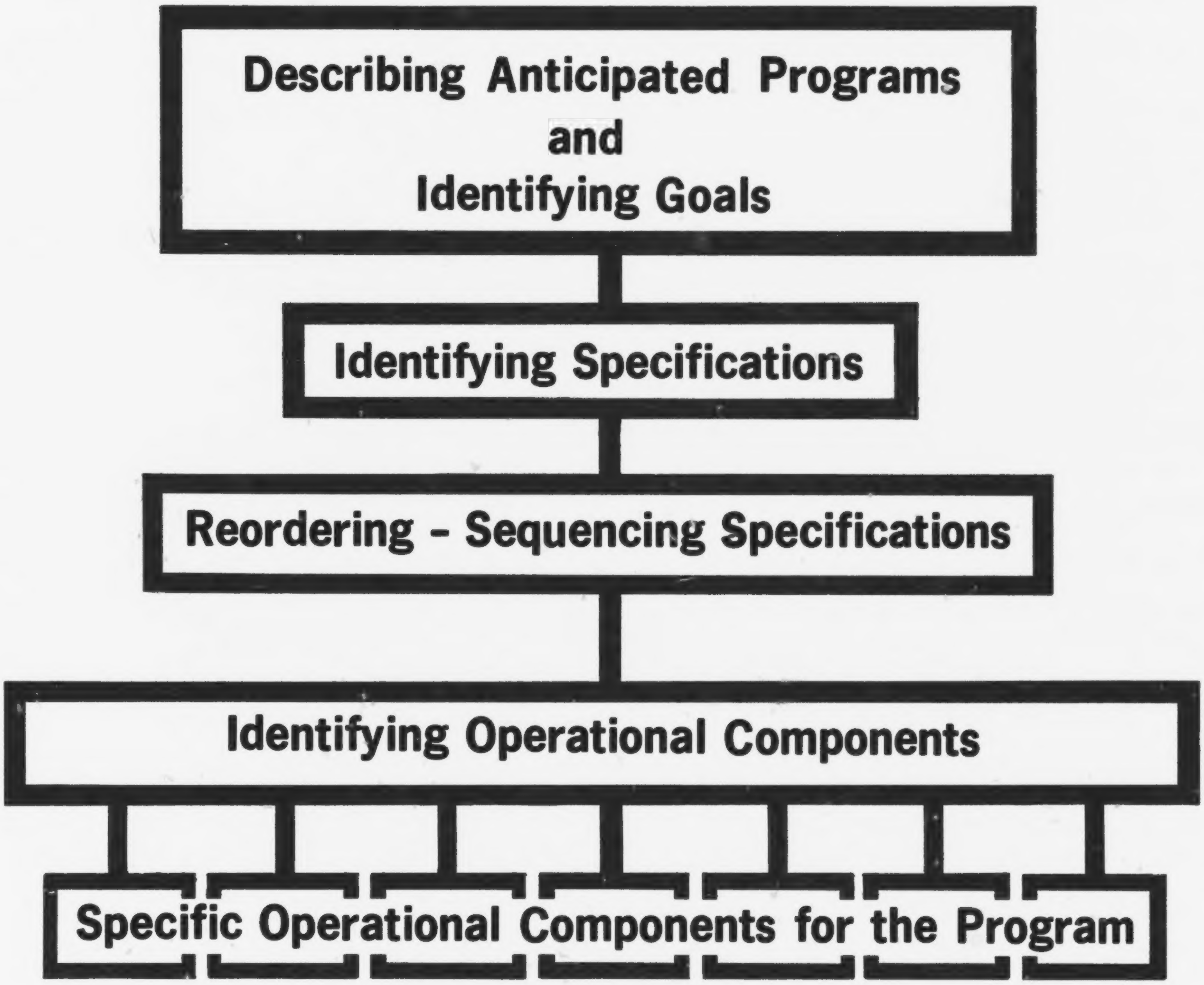

Describing Anticipated Programs and Identifying Goals
Identifying Specifications
Reordering - Sequencing Specifications
Identifying Operational Components
Specific Operational Components for the Program

Figure 7. Sequence of steps for developing composite specifications for model programs.

The initial step of describing an anticipated program and related goals is actually the entre to the specifications (those of this project as presented in Chapter II and the behavioral objectives of Volume II). Based on this description, the target population and topics that apply for this program will be identified and the corresponding specifications identified through a card sort.[20] The topics included are based on the statement of goals for the proposed model program. The specifications will then be reordered or resequenced, if necessary. This reordering can be done on any criterion that appears to be most applicable or efficient. For example, the specifications might be reordered on the basis of where they fit in the time sequence of the program. In an extensive program, they might be ordered on the content they reflect. Another possible reordering, which in essence reflects general operational components, would be the three phases--cognition phase, simulation phase, and operation phase. In any event, the reordering activity sets the stage for defining operational components. It should be noted that the identifying and reordering of specifications does not necessarily involve the development of new specifications. It may be that some specifications are deleted in the reordering activity if they are not needed due to the specifics of the model program. The amount of deletion would depend upon the specific model programs.

The next step of defining operational components is based entirely on the composite specifications identified and reordered for the program under consideration. The operational components will be developed from the treatment part of the specifications. (Tabulations of the incidence of the different types of treatments, and possibly materials and evaluations, from the card deck of specifications, will provide the initial information for development of operational components). Operational components comprise what will be done "to, with, and for" the participants being educated by the program. In this way they provide the model program with specific direction toward implementation.

In summary, the process illustrated in Figure 7 is built entirely around the specifications of this project which provide the source from which the composite specifications are identified. Once the specifications for a model program have been identified they comprise a composite necessary for that program. From this composite of specifications the remaining elements for the model program (namely the operational components) are developed.

## Application of the Process to Six Target Populations

Composite specifications for model programs will now be developed for the six major populations considered throughout this project. The format for presenting each of the six model programs will be the same.

---

[20] As was described in Chapter III, the identification and information for each specification is provided on two cards. Thus, the specifications are coded on a card deck of 1636 cards. It is this card deck that is used for the various card sorts and tabulations when applying the process for developing composite specifications for model programs.

Initially there will be a "running table" of the identification tabulation, and sequencing of the specifications. In the interest of consistency, the specifications will be ordered according to context, subject area, and topic for all six populations. The number immediately following the context, subject and topic indicates the number of specifications for each item.

The running table will be followed by a table giving the incidence of the various treatments, materials, and evaluations appearing in the specifications for the particular program. In order to avoid a cumbersome table, the names of the treatments, materials, and evaluations are coded by number in the lefthand column of the table. The contexts are also coded according to Roman numerals. The code is as follows:

## CONTEXT

I. Instructional Organization

II. Educational Technology

III. Contemporary Learning-Teaching Process

IV. Societal Factors

V. Research

## TREATMENTS

1. Cooperative activity
2. Demonstration
3. Direct Experience
4. Discussion
5. Individual study
6. Observation
7. Simulation
8. Skill development
9. Telling
10. No suggested treatment
11. Other treatments

## MATERIALS

1. Audio-visual materials
2. Books
3. Printed materials (other than books)
4. Library materials
5. Standard multiunit materials
6. Resource materials
7. Laboratory materials
8. Programmed materials
9. Computer
10. Tests
11. No suggested materials
12. Other materials

## EVALUATIONS

1. Conferences
2. Cumulative records
3. Demonstration
4. Examinations
5. Interviews
6. Observation
7. Operation-performance
8. Questionnaire techniques
9. Reports--oral and written
10. Self-appraisal
11. Socio-metric techniques
12. Special assignments and exercises
13. No suggested evaluation
14. Other evaluation

The two major tables for each model program are then followed by a summary statement applicable to the program. The summary statement deals with such factors as possible selection guidelines for the participants of the program, an indication of the sequencing of program content and experiences, and the general nature of the experiences to be encountered in the program.

## The Pre-Service Pre-School and Kindergarten Teachers Model.

### TABLE 2

### COMPOSITE SPECIFICATIONS FOR PRE-SERVICE PRE-SCHOOL AND KINDERGARTEN TEACHERS MODEL PROGRAM BY CONTEXT, SUBJECT AREA, AND TOPIC.

| | Context, Subject Area, Topic | Total Numbers of Specifications | | |
|---|---|---|---|---|
| I. | Instructional Organization<br>Identifying numbers of the specifications | | | 157 |
| | 1001-1003<br>1005-1034<br>1062-1066<br>1069-1073<br>1075-1133<br>1134-1141<br>1145-1150<br>1152<br>1156-1160<br>1164-1165<br>1172<br>1174-1175<br>1177<br>1179-1182<br>1184-1188<br>1190-1193<br>1195<br>1197<br>1199-1203<br>1205<br>1207<br>1210<br>1226-1229 | | | |
| | Necessary Training for Instruction | | 93 | |
| | Topics: 1. General Education | 1 | | |
| | 2. Curriculum Development and Evaluation | 3 | | |
| | 3. Academic Disciplines and Skills--Methodology | 71 | | |
| | 4. Evaluation Techniques for Multi-sized Group Instruction | 4 | | |
| | 5. Curriculum Techniques for Multi-sized Group Instruction | 7 | | |
| | 7. Internship | 7 | | |
| | Necessary Training for Research and Development | | 33 | |
| | Topics: 1. Types of Research and Formulation of Problem Statement and Hypotheses | 6 | | |
| | 2. Experimental Design and Implementation | 12 | | |
| | 3. Statistical Analysis of Experimental Design and Implementation | 2 | | |
| | 4. Testing and Development | 9 | | |
| | 5. Development-Based Research | 4 | | |
| | The Multiunit Organization and Individually Guided Education | | 31 | |
| | Topics: 1. The Context of American Public Education | 1 | | |
| | 2. Organizational Structure and Functions | 11 | | |
| | 3. Roles and Responsibilities | 5 | | |

| | | |
|---|---|---|
| 4. Combination: Organizational Structure and Functions--Roles and Responsibilities | 10 | |
| 9. The Role of the Parent | 3 | |
| 10. Organization of the Environment | 1 | |

II. Educational Technology 60
Identifying numbers of the specifications

2001-2004
2011
2013-2014
2018
2035-2038
2040
2042-2047
2049-2053
2059-2064
2066-2067
2069-2078
2081-2087
2089-2093
2095-2096
2101-2104

| | | |
|---|---|---|
| Instructional Media and Mediated Instruction | | 16 |
| Topics: 1. Selection and Evaluation of Materials | 4 | |
| 2. Design and Construction of Materials | 3 | |
| 3. Utilization of Instructional Materials | 7 | |
| 4. Learning Resources Center | 2 | |
| Programmed Instruction | | 4 |
| Topics: 1. Sources of Instructional Programs and Program Development Information | 1 | |
| 2. Measurable Behavioral Objectives | 2 | |
| 5. Principles of Programmed Instruction | 1 | |
| Computer Assisted Instruction | | 18 |
| Topics: 1. Elements of a CAI System | 2 | |
| 2. Applications of a Computer to Instruction | 2 | |
| 3. Advantages and Limitations of CAI | 2 | |
| 4. Pupil Performance Data | 2 | |
| 5. Development and Revision of Programs for a CAI System | 3 | |
| 6. Sources and Evaluation of CAI Systems and Programs | 4 | |
| 7. Operation of Equipment | 1 | |
| 8. Administration of a CAI System | 2 | |
| Instructional Simulation and Academic Games | | 14 |
| Topics: 1. Introduction | 6 | |
| 2. Selection | 2 | |
| 3. Utilization in Instruction | 4 | |
| 4. Evaluation | 2 | |
| Microteaching | | 4 |
| Topics: 1. The Uses of Microteaching and Characteristics of Microteaching | 1 | |
| 3. Participation in Microteaching | 3 | |
| Research in Educational Technology | | 4 |
| Topics: 1. Preliminary Study | 3 | |
| 2. Basing the System on Research | 1 | |

III. Contemporary Learning-Teaching Process 102
Identifying numbers of the specifications

3001-3006
3008-3019
3021-3029
3037-3040
3042-3053
3064-3066
3069
3073-3074
3076
3078-3100
3112-3119
3123-3143

|  |  |  |
|---|---|---|
| Cognitive Domain |  | 21 |
| Topics: 1. Theories of Concept Learning | 6 |  |
| 2. Concept Formation | 7 |  |
| 3. Problem Solving | 4 |  |
| 4. Creativity | 4 |  |
| Affective Domain |  | 11 |
| Topics: 1. Attitudes and Values | 7 |  |
| 2. Personality Integration | 4 |  |
| Social Learning (Including Psychomotor Domain) |  | 20 |
| Topics: 1. Social Skills | 12 |  |
| 2. Psychomotor Skills | 8 |  |
| Basic Behavioral Operations |  | 27 |
| Topics: 1. Reinforcement | 6 |  |
| 2. Extinction | 9 |  |
| 3. Punishment | 4 |  |
| 4. Schedules of Reinforcement | 8 |  |
| Contingency Management |  | 19 |
| Topics: 1. Premack Principle | 2 |  |
| 2. Successive Approximations | 2 |  |
| 3. Task and Reinforcing Event Areas | 4 |  |
| 4. Reinforcing Event Menu | 2 |  |
| 5. Contract Apron | 1 |  |
| 6. Techniques for Automatic Contingency Management Generation | 1 |  |
| 7. Contingency Contracting | 4 |  |
| 8. Progress Checks | 3 |  |
| Self-Management |  | 4 |
| Topics: 1. Self-Contracting | 1 |  |
| 2. Contiguity Principle Applied to Self-Management | 2 |  |
| 3. Elimination of Undesirable Behavior | 1 |  |

IV. Societal Factors 74
Identifying numbers of the specifications

4001-4017
4037-4048
4079-4085
4099-4114
4138-4149
4153-4162

|  |  |  |
|---|---|---|
| Culture and Cultural Transmission |  | 16 |
| Topics: 1. Enculturation | 6 |  |
| 2. Culture, Education, and Curriculum | 4 |  |

| | | | | | |
|---|---|---|---|---|---|
| | 3. | The Impact of Mass Media | 2 | | |
| | 4. | Discontinuity | 4 | | |
| Social Stratification and Social Mobility | | | | 12 | |
| Topics: | 1. | Social Stratification and Its Effect on Education | 6 | | |
| | 2. | Social Mobility | 5 | | |
| | 3. | Methods of Increasing Social Mobility | 1 | | |
| Demographic Forces | | | | 8 | |
| Topics: | 1. | Population Growth | 4 | | |
| | 2. | Geographic Mobility | 2 | | |
| | 3. | Population Distribution | 2 | | |
| Cultural Change | | | | 16 | |
| Topics: | 1. | Cultural Lag Problems in the School | 5 | | |
| | 2. | The Expanding Role of the School | 1 | | |
| | 3. | Modification of Educational Processes by Technology | 2 | | |
| | 4. | Theories of Social Change | 3 | | |
| | 5. | Response of Education to Socio-Cultural Change | 5 | | |
| Social Control | | | | 12 | |
| Topics: | 1. | Roles within the School | 2 | | |
| | 2. | Role of Community Pressure Groups in Control of Education | 6 | | |
| | 3. | The Role of Federal, State, and Local Government in Control of Education | 1 | | |
| | 4. | The Role of Teacher Organizations in Control of Education | 1 | | |
| | 5. | The Effect of Religious Control on Education | 1 | | |
| | 6. | The Role of Industry in Control of Education | 1 | | |
| Education as a Social Institution | | | | 10 | |
| Topics: | 1. | Interactional Patterns | 4 | | |
| | 2. | Bureaucratic Hierarchy | 3 | | |
| | 3. | Career Patterns of Teachers | 2 | | |
| | 4. | Differential Standards that Affect the Status of the Profession | 1 | | |
| V. Research | | | | | 67 |

Identifying numbers of the specifications

5001-5014
5040-5043
5055-5057
5098-5125
5135-5151
5178

| | | | | |
|---|---|---|---|---|
| Research Reports | | | | 4 |
| Topics: | 1. | Evaluating a Research Report | 3 | |
| | 2. | Implementing the Findings of a Research Report | 1 | |
| Research on Teacher Education Practices | | | | 3 |
| Topics: | 6. | Development of the Multiunit School | 3 | |
| Research on Teacher Characteristics | | | | 14 |
| Topics: | 1. | Teacher Characteristics | 3 | |
| | 2. | Attitudes | 2 | |
| | 3. | Values, Interests, and Favored Activities | 2 | |
| | 5. | Personality Factors | 1 | |
| | 7. | Cross-cultural and Cross-national Characteristics | 6 | |
| Research on Teacher Behaviors | | | | 28 |
| Topics: | 1. | Assessment of Teacher Behavior | 12 | |
| | 2. | Interaction Analysis | 12 | |
| | 3. | Evaluation of Teacher Behavior | 4 | |
| Media and Innovations in Teacher Education | | | | 18 |
| Topics: | 1. | Providing More Efficient Observation of Classroom Behavior | 7 | |
| | 2. | Providing More Efficient Self-Instruction and Supervised Practice Experiences | 5 | |
| | 3. | Providing a Direct Means of Presenting Teacher Education Courses | 2 | |
| | 4. | Providing Better Standards of Teacher Performance | 2 | |
| | 5. | Conducting Basic Research into Teaching and Learning Processes | 2 | |
| Total Numbers of Specifications for Pre-Service Teacher-Pre-School and Kindergarden | | | | 460 |

## TABLE 3

## INCIDENCE OF TREATMENT, EVALUATION, AND MATERIALS BY CONTEXT IN THE COMPOSITE SPECIFICATION FOR THE PRE-SERVICE - - PRE-SCHOOL AND KINDERGARTEN TEACHERS' MODEL PROGRAM

| | | CONTEXT | | | | | |
|---|---|---|---|---|---|---|---|
| | Code Number | I | II | III | IV | V | Total |
| TREATMENT | 1 | 55 | 8 | 34 | 6 | 14 | 117 |
| | 2 | 17 | 21 | 13 | 11 | 2 | 64 |
| | 3 | 13 | 25 | 25 | 17 | 9 | 89 |
| | 4 | 61 | 22 | 34 | 14 | 33 | 164 |
| | 5 | 73 | 30 | 47 | 24 | 41 | 215 |
| | 6 | 36 | 10 | 24 | 25 | 22 | 117 |
| | 7 | 20 | 8 | 14 | 14 | 10 | 66 |
| | 8 | 8 | 18 | 36 | 13 | 20 | 95 |
| | 9 | 45 | 10 | 40 | 28 | 13 | 136 |
| | 10 | 2 | 0 | 0 | 0 | 0 | 2 |
| | 11 | 4 | 3 | 0 | 0 | 0 | 7 |
| MATERIALS | 1 | 54 | 85 | 35 | 24 | 18 | 216 |
| | 2 | 105 | 36 | 83 | 70 | 57 | 351 |
| | 3 | 97 | 7 | 3 | 18 | 6 | 131 |
| | 4 | 20 | 4 | 11 | 3 | 38 | 76 |
| | 5 | 2 | 21 | 14 | 4 | 1 | 42 |
| | 6 | 1 | 2 | 9 | 0 | 1 | 13 |
| | 7 | 5 | 20 | 24 | 2 | 12 | 63 |
| | 8 | 2 | 3 | 1 | 2 | 0 | 8 |
| | 9 | 0 | 8 | 0 | 1 | 0 | 9 |
| | 10 | 7 | 0 | 0 | 0 | 3 | 10 |
| | 11 | 4 | 0 | 3 | 0 | 0 | 7 |
| | 12 | 24 | 22 | 14 | 4 | 2 | 66 |
| EVALUATION | 1 | 45 | 2 | 7 | 3 | 15 | 72 |
| | 2 | 1 | 0 | 0 | 0 | 0 | 1 |
| | 3 | 12 | 5 | 8 | 7 | 16 | 48 |
| | 4 | 49 | 30 | 53 | 16 | 21 | 169 |
| | 5 | 0 | 0 | 2 | 1 | 9 | 12 |
| | 6 | 11 | 8 | 23 | 11 | 4 | 57 |
| | 7 | 13 | 2 | 1 | 12 | 9 | 37 |
| | 8 | 0 | 0 | 0 | 1 | 1 | 2 |
| | 9 | 45 | 30 | 37 | 42 | 27 | 181 |
| | 10 | 5 | 0 | 4 | 2 | 1 | 12 |
| | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12 | 22 | 13 | 16 | 3 | 6 | 60 |
| | 13 | 1 | 0 | 0 | 0 | 0 | 1 |
| | 14 | 9 | 1 | 0 | 4 | 0 | 14 |

The pre-service teacher--pre-school and kindergarten personnel target population will involve new elements in the educational process. A majority of teacher education institutions are not preparing teachers for instructional levels below kindergarten and certification for pre-school teaching is not a common practice. The nature of a teacher education program for the pre-school and kindergarten population can and does vary, but it is assumed that the specifications of Table 2 would comprise the program.

Students who decide to become pre-school-kindergarten teachers should be recruited from the same potential teacher populations from which all elementary school teachers can be found. Selection criteria, therefore, for pre-school and kindergarten teachers will be basically the same as for elementary teachers of older pupil levels. Criteria listed in the section relating to the pre-service elementary teacher will apply to this population. In addition, pre-school and kindergarten pre-service students will need to express an interest in working with three-, four-, and five-year old pupils and be able to demonstrate through classroom techniques and procedures an ability to work successfully with these children. Since many of the activities which are prescribed by the specifications will involve the parents and the community, a strong orientation dealing with communication between the school, parents and community must be present in the program. This means that the potential teacher must be able to communicate easily with parents of pre-school children and exhibit the personality characteristics which facilitate inter-personal relationships. Personality characteristics such as warmth and understanding need emphasis in the admission of teacher candidates.

Once admitted to the pre-school-kindergarten teacher education program, the students' retention will be based on satisfactory achievement of the specifications and the continued demonstration of personality and other desirable characteristics deemed necessary by the preparatory institution.

The sequencing of specifications for a group of pre-school-kindergarten teachers could vary according to the priorities established and the organizing elements selected by the implementing institution. The order of specifications used in this instance was in accordance with the framework of the five contexts. Within each context there are several major subject areas each of which contains a number of topics. This arrangement provides the logical development of the educational specifications within each context.

Arranging effective sequences is a major portion of intelligent planning that will hopefully lead to successful teaching. Individualized programs for pre-service, pre-school-kindergarten teachers can be created by reordering the specifications to meet the needs of the individuals who are receiving the instruction. This would need to be accomplished during institutional implementation of the specifications and would help each student to engage in the learning activities for which he is ready. Since the students will differ in what they are ready to do, they would not all be expected to work with the same number of specifications within the same period of time.

The procedures for implementing the specifications will include a self-correcting and up-dating aspect so that the program can become a dynamic rather than a static process. The undergraduate preparation for this population will vary in kind and in size. Instruction for each student will become individualized, and he will be encouraged to progress at his own rate of speed. Monitoring and feedback will be utilized constantly to determine what that rate is and how to assess more accurately each student's progress through the program. The students' learning environment will be extended beyond the usual walls of the classroom to include a broad range of cultural activities which will widen their interests and heighten their educational aspirations. With their individual skills and abilities recognized, pre-school personnel will show more enthusiasm for their work and will make greater use of their individual abilities.

The educational specifications which have been developed for pre-school and kindergarten teachers place a stress on all contexts with Instructional Organization, Contemporary Learning-Teaching Process, and Societal Factors receiving the most emphasis. The context Instructional Organization receives the most attention with this target population because it includes the subject area on "Necessary Training for Instruction" which encompasses most of the area of specialization necessary to prepare pre-school teachers. Further, this context deals with the "Necessary Training for Research" and the "Organization of the Multiunit School" for such teaching personnel. Students entering a program for the education of three-, four-, and five-year old pupils will learn that education for pre-school children can be conducted in an organized, planned manner. The multiunit school approach with the use of R & I Units can provide such organization and yet meet the individual needs of early childhood. Relieved of many non-professional tasks within the multiunit environment, pre-school teachers will have more time to teach, participate in research, and develop new and effective procedures of teaching. By learning how to work together in teams, early childhood teachers will develop professional partnerships of real value for the educational program and its recipients. The specifications call for a thorough exploration of the differences, advantages and disadvantages of self-contained and multiunit schools and classrooms. There will be training for research in the classroom setting. The "how-to-do-it" of team teaching will be provided which includes differentiated roles of personnel, varying functions and needed organizational structure. Potential teachers will learn about instructional decision making, how to diagnose pupil characteristics, and the involvement of research, development and innovation in the classroom. It is anticipated that the model will call for a close and continuing involvement of the laboratory (early childhood classrooms) and the theoretical instructional base (college and university) in the educational process, culminating in an extensive internship.

Much of the education of early childhood teachers is directed toward the techniques of individualized instruction. The patterns of individual learning and teaching being demonstrated in the primary school revolution in Britain are examined for the promise they hold for American classrooms. There is a call for "learning by discovery," and the view is taken that pre-school and kindergarten education requires an earlier consideration than once thought possible of mathematics, science, social studies, and language arts.

The specifications indicate that the pre-school-kindergarten teacher will be more generally prepared and not specialized in a single elementary school content area as is the elementary teacher. Subject matter training will include the language arts (including reading), mathematics, science, social studies, art, music, and health and physical education. The specialization of this target population will be considered to be pre-school-kindergarten education.

The specifications in the Contemporary Learning-Teaching Process context emphasize a broad understanding of this area which involves both developmental and behaviorist psychology. There is stress on the cognitive domain, social learning and basic behavioral operations. The teacher education program concern is to obtain the best of "both worlds" in the learning-teaching process and prepare early childhood teachers accordingly.

The context of Societal Factors calls for a change from the usual course work in the history and philosophy of education to a thorough study of the factors in society which have present and important implications for pre-school teachers in the teaching of young children. The specifications call for an attempt to inculcate students with a degree of cultural relativism--a better understanding of cultural values and differences and what can be done, educationally, from a more enlightened viewpoint. The subject areas stressed are "Culture and Cultural Transmissions," "Educational and Cultural Change," "Social Stratification and Social Mobility," "Social Control," and "Education as a Social Institution." The specifications call for an individual effort to be more objective as a teacher views socio-cultural situations and to be able to divest himself of his own values to better understand and work with others utilizing other value systems. More experiences in the field are required across all years of the undergraduate program and situations are contrived to anticipate certain kinds of social problems and the offering of possible solutions. The instructional effort is concerned not only with the education of children but of parents and the establishment of effective parent-teacher relationships.

The context of Educational Technology emphasizes a far more adequate knowledge and utilization of this area by pre-school and kindergarten teachers than has formerly been the case. The specifications require a thorough consideration of media and mediated instruction, computer assisted instruction, and games and simulations. Full familiarity with research on educational technology is required as well as sources of information on the subject and various types of teaching materials. The use of microteaching is advocated for self-analysis and skill development.

The specifications for the Research context place a strong emphasis on teacher behaviors and teacher characteristics. Pre-school and kindergarten teachers will complete specifications which will make them adept at assessing and evaluating their verbal and non-verbal behavior through the use of interaction analysis, feedback using other techniques, video taping and similar methods. Since the impact of the teachers' behavior on the learner is especially significant at this level, this target population will devote a great deal of time to the study of teaching behavior and style. A similar concern for a study of teacher characteristics will be necessary to understand better the intellectual and personal characteristics of teachers and the influence these have on teaching effectiveness in different teaching situations. A particular emphasis will be on the positive and negative attitudes of teachers toward children and teaching and on understanding cross-cultural and cross-national differences in pupils and teachers. In addition to investigating the research in these areas, students will be expected to spend much time in direct observation and participation in various cultural groups, and may, in fact, spend some time abroad.

An analysis of the specifications in respect to treatment, materials and evaluation indicates that all possible activities and sources of information are desirable for potential early childhood teachers. The dominant treatments suggested are cooperative activity, direct experiences, discussion, individual study, observation, skill development and telling. A strong emphasis upon the use of books, audio-visual materials, and printed materials other than books is shown in the use of materials which indicates that this target population will acquire much of their new knowledge from reading and the utilization of many kinds of audio-visual materials. Evaluation techniques recommended most frequently include examinations, reports, conferences, observations, and special assignments and exercises.

Flexibility will be the key word in describing the preparation of pre-school and kindergarten teachers. Team teaching will be used to relieve teachers of the isolation so common to the teaching profession. The teacher will have ample opportunity to depart from the use of sterile and traditional methods and materials inconsistent with new research, to adopt new teaching and individualized techniques within the multiunit structure, and to use new and varied instructional materials to develop thinking and creativity in pupils rather than inculcating memorization and routine.

## TABLE 4

### COMPOSITE SPECIFICATIONS FOR PRE-SERVICE ELEMENTARY TEACHERS (GRADES 1-8) MODEL PROGRAM BY CONTEXT, SUBJECT AREA, AND TOPIC

| Context, Subject Area, Topic | | | Total Numbers of Specifications |
|---|---|---|---|
| I. Instructional Organization<br>Identifying numbers of the specifications | | | 151 |
| 1001-1003<br>1005-1032<br>1034<br>1062-1067<br>1069-1132<br>1134-1141<br>1145-1150<br>1152<br>1156-1160<br>1164-1165<br>1172<br>1174-1175<br>1177<br>1179-1182<br>1184-1188<br>1190-1193<br>1195<br>1197<br>1199-1203<br>1205<br>1207<br>1210 | | | |
| Necessary Training for Instruction | | 92 | |
| Topics: 1. General Education | 1 | | |
| 2. Curriculum Development and Evaluation | 3 | | |
| 3. Academic Disciplines and Skills--Methodology | 70 | | |
| 4. Evaluation Techniques for Multi-sized Group Instruction | 4 | | |
| 5. Curriculum Techniques for Multi-sized Group Instruction | 7 | | |
| 7. Internship | 7 | | |
| Necessary Training for Research and Development | | 33 | |
| Topics: 1. Types of Research and Formulation of Problem Statement and Hypotheses | 6 | | |
| 2. Experimental Design and Implementation | 12 | | |
| 3. Statistical Analysis of Experimental Data and Interpretation of Results | 2 | | |
| 4. Testing and Development | 9 | | |
| 5. Development-Based Research | 4 | | |
| Multiunit Organization and Individually Guided Education | | 26 | |
| Topics: 1. The Context of American Public Education | 1 | | |
| 2. Organizational Structure and Functions | 11 | | |
| 3. Roles and Responsibilities | 4 | | |
| 4. Combination: Organizational Structure and Functions--Roles and Responsibilities | 10 | | |

II. Educational Technology 75
Identifying numbers of the specifications

2001-2004
2009-2018
2020-2028
2030-2031
2035-2038
2041-2047
2049-2053
2059-2067
2069-2070
2072
2075-2078
2081-2087
2089-2093
2095-2096
2101-2104

| | | | | |
|---|---|---|---|---|
| Instructional Media and Mediated Instruction | | | | 16 |
| Topics: | 1. | Selection and Evaluation of Materials | 4 | |
| | 2. | Design and Construction of Materials | 3 | |
| | 3. | Utilization of Instructional Materials | 7 | |
| | 4. | Learning Resources Center | 2 | |
| Programmed Instruction | | | | 21 |
| Topics: | 1. | Sources of Instructional Programs and Program Development Information | 4 | |
| | 2. | Measurable Behavioral Objectives | 2 | |
| | 3. | Advantages and Disadvantages | 1 | |
| | 4. | Instructional Programs and Instructional Events | 2 | |
| | 5. | Principles of Programmed Instruction | 3 | |
| | 6. | Prompting | 1 | |
| | 7. | Learning Tasks Accomplished by Programmed Instruction | 2 | |
| | 8. | Student Performance Data | 3 | |
| | 9. | Teaching Machines | 2 | |
| | 10. | Instructional Program Development and Adaptation | 1 | |
| Computer-Assisted Instruction | | | | 16 |
| Topics: | 1. | Elements of a CAI System | 2 | |
| | 2. | Applications of a Computer to Instruction | 2 | |
| | 3. | Advantages and Limitations of CAI | 2 | |
| | 4. | Pupil Performance Data | 3 | |
| | 5. | Development and Revision of Programs for a CAI System | 2 | |
| | 6. | Sources and Evaluation of CAI Systems and Programs | 2 | |
| | 7. | Operation of Equipment | 1 | |
| | 8. | Administration of a CAI System | 2 | |
| Instructional Simulation and Academic Games | | | | 14 |
| Topics: | 1. | Introduction | 6 | |
| | 2. | Selection | 2 | |
| | 3. | Utilization in Instruction | 4 | |
| | 4. | Evaluation | 2 | |
| Microteaching | | | | 4 |
| Topics: | 1. | The Uses of Microteaching and Characteristics of Microteaching | 1 | |

| | | | | |
|---|---|---|---|---|
| | 3. Participation in Microteaching | 3 | | |
| Research in Educational Technology | | | 4 | |
| Topics: | 1. Preliminary Study | 3 | | |
| | 2. Basing the System on Research | 1 | | |
| III. Contemporary Learning-Teaching Process | | | | 102 |

Identifying numbers of the specifications

| | | |
|---|---|---|
| 3001-3006 | 3042-3053 | 3076 |
| 3008-3019 | 3064-3066 | 3078-3100 |
| 3021-3029 | 3069 | 3112-3119 |
| 3037-3040 | 3073-3074 | 3123-3143 |

| | | | |
|---|---|---|---|
| Cognitive Domain | | | 21 |
| Topics: | 1. Theories of Concept Learning | 6 | |
| | 2. Concept Formation | 7 | |
| | 3. Problem Solving | 4 | |
| | 4. Creativity | 4 | |
| Affective Domain | | | 11 |
| Topics: | 1. Attitudes and Values | 7 | |
| | 2. Personality Integration | 4 | |
| Social Learning (Including Psychomotor Domain) | | | 20 |
| Topics: | 1. Social Skills | 12 | |
| | 2. Psychomotor Skills | 8 | |
| Basic Behavioral Operations | | | 27 |
| Topics: | 1. Reinforcement | 6 | |
| | 2. Extinction | 9 | |
| | 3. Punishment | 4 | |
| | 4. Schedules of Reinforcement | 8 | |
| Contingency Management | | | 19 |
| Topics: | 1. Premack Principle | 2 | |
| | 2. Successive Approximations | 2 | |
| | 3. Task and Reinforcing Event Areas | 4 | |
| | 4. Reinforcing Event Menu | 2 | |
| | 5. Contract Apron | 1 | |
| | 6. Techniques for Automatic Contingency Management Generation | 1 | |
| | 7. Contingency Contracting | 4 | |
| | 8. Progress Checks | 3 | |
| Self-Management | | | 4 |
| Topics: | 1. Self-Contracting | 1 | |
| | 2. Contiguity Principle Applied to Self-Management | 2 | |
| | 3. Elimination of Undesirable Behavior | 1 | |

## IV. Societal Factors 69

Identifying numbers of the specifications

4001
4003-4012
4026
4037-4048
4079-4085
4099-4114
4138-4149
4153-4162

| | | |
|---|---|---|
| Culture and Cultural Transmission | | 11 |
| Topics: 1. Enculturation | 5 | |
| 2. Culture, Education and Curriculum | 2 | |
| 3. The Impact of Mass Media | 2 | |
| 4. Discontinuity | 2 | |

| | | |
|---|---|---|
| Social Stratification and Social Mobility | | 12 |
| Topics: 1. Social Stratification and Its Effect on Education | 6 | |
| 2. Social Mobility | 5 | |
| 3. Methods of Increasing Social Mobility | 1 | |

| | | |
|---|---|---|
| Demographic Forces | | 8 |
| Topics: 1. Population Growth | 4 | |
| 2. Geographic Mobility | 2 | |
| 3. Population Distribution | 2 | |

| | | |
|---|---|---|
| Cultural Change | | 16 |
| Topics: 1. Cultural Lag Problems in the School | 5 | |
| 2. The Expanding Role of the School | 1 | |
| 3. Modification of Educational Processes by Technology | 2 | |
| 4. Theories of Social Change | 3 | |
| 5. Response of Education to Socio-Cultural Change | 5 | |

| | | |
|---|---|---|
| Social Control | | 12 |
| Topics: 1. Roles Within the School | 2 | |
| 2. Role of Community Pressure Groups in Control of Education | 6 | |
| 3. The Role of Federal, State and Local Government in Control of Education | 1 | |
| 4. The Role of Teacher Organizations in Control of Education | 1 | |
| 5. The Effect of Religious Control on Education | 1 | |
| 6. The Role of Industry in Control of Education | 1 | |

| | | |
|---|---|---|
| Education as a Social Institution | | 10 |
| Topics: 1. Interactional Patterns | 4 | |
| 2. Bureaucratic Hierarchy | 3 | |
| 3. Career Patterns of Teachers | 2 | |
| 4. Differential Standards that Affect the Status of the Profession | 1 | |

67

V. Research
Identifying numbers of the specifications

5001-5014
5040-5043
5055-5057
5098-5125
5135-5151
5178

| | | | |
|---|---|---|---|
| Research Reports | | | 4 |
| Topics: | 1. Evaluating a Research Report | 3 | |
| | 2. Implementing the Findings of a Research Report | 1 | |
| Research on Teacher Education Practices | | | 3 |
| Topics: | 6. Development of the Multiunit School | 3 | |
| Research on Teacher Characteristics | | | 14 |
| Topics: | 1. Teacher Characteristics | 3 | |
| | 2. Attitudes | 2 | |
| | 3. Values, Interests, and Favored Activities | 2 | |
| | 5. Personality Factors | 1 | |
| | 6. Cognitive Abilities | 6 | |
| Research on Teacher Behaviors | | | 28 |
| Topics: | 1. Assessment of Teacher Behavior | 12 | |
| | 2. Interaction Analysis | 12 | |
| | 3. Evaluation of Teacher Behavior | 4 | |
| Media and Innovations in Teacher Education | | | 18 |
| Topics: | 1. Providing More Efficient Observation of Classroom Behavior | 7 | |
| | 2. Providing More Efficient Self-Instruction and Supervised Practice Experiences | 5 | |
| | 3. Providing a Direct Means of Presenting Teacher Education Courses | 2 | |
| | 4. Providing Better Standards of Teacher Performance | 2 | |
| | 5. Conducting Basic Research into Teaching and Learning Processes | 2 | |
| Total number of Specifications for Pre-Service Elementary Teachers (Grades 1-8) Model | | | 464 |

## TABLE 5

## INCIDENCE OF TREATMENT, MATERIALS, AND EVALUATIONS BY CONTEXT IN THE COMPOSITE SPECIFICATION FOR THE PRE-SERVICE - ELEMENTARY TEACHERS (GRADES 1-8) MODEL PROGRAM.

| | Code Number | CONTEXT | | | | | |
|---|---|---|---|---|---|---|---|
| | | I | II | III | IV | V | Total |
| TREATMENT | 1 | 55 | 8 | 34 | 6 | 14 | 117 |
| | 2 | 17 | 22 | 13 | 11 | 2 | 65 |
| | 3 | 13 | 24 | 25 | 16 | 9 | 87 |
| | 4 | 59 | 27 | 34 | 14 | 33 | 167 |
| | 5 | 74 | 43 | 47 | 24 | 41 | 229 |
| | 6 | 34 | 10 | 24 | 23 | 22 | 113 |
| | 7 | 20 | 10 | 14 | 13 | 10 | 67 |
| | 8 | 8 | 21 | 36 | 13 | 20 | 98 |
| | 9 | 43 | 20 | 40 | 27 | 13 | 143 |
| | 10 | 2 | 0 | 0 | 0 | 0 | 2 |
| | 11 | 4 | 2 | 0 | 0 | 0 | 6 |
| MATERIALS | 1 | 53 | 102 | 35 | 23 | 18 | 231 |
| | 2 | 102 | 49 | 83 | 66 | 57 | 357 |
| | 3 | 95 | 6 | 3 | 18 | 6 | 128 |
| | 4 | 20 | 7 | 11 | 3 | 38 | 79 |
| | 5 | 2 | 23 | 14 | 4 | 1 | 44 |
| | 6 | 1 | 2 | 9 | 0 | 1 | 13 |
| | 7 | 5 | 20 | 22 | 2 | 12 | 61 |
| | 8 | 2 | 9 | 1 | 2 | 0 | 14 |
| | 9 | 0 | 9 | 0 | 1 | 0 | 10 |
| | 10 | 7 | 0 | 0 | 0 | 3 | 10 |
| | 11 | 4 | 0 | 3 | 0 | 0 | 7 |
| | 12 | 23 | 25 | 14 | 3 | 2 | 67 |
| EVALUATION | 1 | 44 | 3 | 7 | 3 | 15 | 72 |
| | 2 | 1 | 0 | 0 | 0 | 0 | 1 |
| | 3 | 11 | 6 | 8 | 7 | 16 | 48 |
| | 4 | 49 | 39 | 53 | 15 | 21 | 177 |
| | 5 | 0 | 0 | 2 | 0 | 9 | 11 |
| | 6 | 11 | 12 | 23 | 11 | 4 | 61 |
| | 7 | 13 | 4 | 1 | 11 | 9 | 38 |
| | 8 | 0 | 0 | 0 | 1 | 1 | 2 |
| | 9 | 42 | 36 | 37 | 40 | 27 | 182 |
| | 10 | 5 | 2 | 4 | 2 | 1 | 14 |
| | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12 | 21 | 13 | 16 | 3 | 6 | 59 |
| | 13 | 1 | 0 | 0 | 0 | 0 | 1 |
| | 14 | 9 | 1 | 0 | 4 | 0 | 14 |

The development of professionally competent elementary teachers is dependent both on the achievement and characteristics which a prospective teacher brings to the pre-service program at the time of admission and the skills and talents developed within the span of formal preparation. To insure the quality of the product, it is imperative that selective admission and retention be elements of the model program. At the time of admission of the prospective student, consideration should be given to four general categories: (a) health and physical vitality, (b) intellectual capacity and scholastic achievement, (c) interest in children and desire to teach, and (d) a combination of personal-social-emotional qualities. The assessment of the factors in the above categories will be determined from previous student records and various admission examinations. The particular instruments and methods used in this process will be determined by the implementing institution. Continuation of the elementary education candidate in the program is dependent upon the student making normal progress in the completion of various phases of the program plus increasing evidence of growth in behaviors considered vital to teaching success.

The proposed model has unique features, each of which demands the presence and attainment of skills and characteristics not required by traditional programs. It is essential that in the implementation of the model a flexible plan of admission and retention relevant to the goals and procedures of the program be devised, and through research in the first few years, this plan be modified to complement the model to such a degree that admission to the program implies promise of academic and teaching success.

It is possible for the specifications of the pre-service elementary teacher model to be ordered in various arrangements for implementation. At present there are no criteria to indicate that any one pattern is superior to all others. As was indicated for the pre-school-kindergarten teacher model, the sequencing of specifications will vary according to the priorities established and the organizing elements selected by the implementing institution. However, it is apparent that the guiding factors in sequencing, at least in the early stages of implementation, should be the logical organization of the content and the sequential development of learning experiences through the levels of assimilation, cognition, and application.

Again it must be pointed out that the procedures for implementing the specifications will include a self-correcting and up-dating aspect; program procedures would continue to be dynamic and never static. The individualizing of instruction would again be a major feature of the model as would be the continuous linking of public school and university resources and environments in the instructional process. A teacher education program which attempts to teach others how to carry on individualized instruction must practice what it advocates. The admonitions about sequencing made for the pre-school-kindergarten teacher model apply equally to the elementary teacher target population.

The order of specifications utilized in this instance is again in accordance with the five contexts and their internal patterns of organization. The specifications indicated in Table 4 are, in many instances, identical with those ordered for the preparation of early childhood teachers. Thus, the preparation of both pre-service target populations will have many things in common as would be expected. However, important differences in the preparation of these teachers will also be apparent and necessary.

The principal effort of this project was to develop educational specifications for pre-service target populations. Under these circumstances, the specifications ordered for the preparation of prospective elementary teachers emphasize all contexts with Instructional Organization and Contemporary Learning-Teaching Process receiving greater concern and Educational Technology, Societal Factors, and Research receiving slightly less consideration.

In the context of Instructional Organization, the greatest specification emphasis is placed on "Necessary Training for Instruction" with the topic of "The Methodology of Academic Disciplines and Skills" receiving the most attention. The subject areas "Necessary Training for Research" and "Multiunit Organization and Individually Guided Education" are also stressed. The focus in this contextual area is to prepare the elementary teacher thoroughly for teaching in an R & I Unit in a multiunit school and to function in all the roles and responsibilities of a team teacher, including that of the unit leader. Practically everything previously stated about the pre-school-kindergarten teacher preparation in this context is applicable to the elementary teacher population. The methods of team-teaching are fully covered and there is considerable emphasis on the techniques of multisized group and individually guided instruction. Training for research in the classroom setting is completely specified. A highly structured internship is indicated. A review of each specification ordered for this target population in Volume II will provide the comprehensiveness and detail of the instruction suggested.

The major differences in the specifications indicated for the elementary and pre-school target populations in the context of Instructional Organization are in the curriculums suggested for the two populations, the emphasis on academic disciplines and skills, and the relationship of the teacher to the role of the parent. The preparation of elementary teachers will stress basic instructional competence in the fields of reading and other language arts, mathematics, social studies and science with the requirement of further specialization in one of these fields of study. The intent is to enable each elementary education candidate to be a specialist in one field of the basic elementary school curriculum and still have general skills and knowledge in the other three areas. Each multiunit elementary school would thus be staffed with specialists in the four basic elementary school fields of study. Unlike the pre-school-kindergarten teacher, the elementary teacher would not have subject matter preparation as a generalist. There would be less emphasis on music, art, and health and physical education for the elementary target population as the multiunit school would be expected to have a specialist available from each of these fields. The emphasis on academic disciplines and skills would be more limited in one sense but with greater depth than is presently the case. Student preparation would be more concentrated on the knowledge and teaching of the language arts, mathematics, social studies and science. The concern of prospective elementary teachers with the role of parents would be definitely less than that of pre-school teachers, as the multiunit school would also be staffed with an elementary guidance specialist and what teacher contact there was with parents would come principally from this specialist and the leader of the teaching team.

The specifications in the Contemporary Learning-Teaching Process require the same broad understanding of this area as previously described for the pre-school teacher. The specification concerns are primarily for the subjects of "Cognitive Domain," "Social Learning," "Basic Behavioral Operations," and "Contingency Management." The reader should not interpret this as a primary reliance on behaviorist psychology but rather an attempt to utilize this approach to learning and teaching in certain aspects of elementary school subject matter while also continuing a healthy concern for the developmental point of view and its classroom implications.

The Societal Factors context has highly important considerations for the elementary teacher education student. These were alluded to in the discussion of specifications from this context for the pre-school-kindergarten teacher. Carrying that discussion further, there will be less emphasis on what has been known in teacher education as "foundations of education" courses with their systematic delineation of philosophic positions and historical developments. Instead the effort will be to develop the analytic tools of the modern educational philosophers and implement these in classroom situations. The elementary teacher will hopefully become more objective as he views socio-cultural situations and his concern will be not only to understand but to learn how to cope with the situations presented. Thus, the subjects of concern for elementary trainees in this context involve a full consideration of "Culture and Cultural Transmission," "Social Stratification and Social Mobility," "Demographic Forces," "Education and Cultural Change," "Social Control," and "Education as a Social Institution."

The context of Educational Technology for the elementary teacher trainee holds greater importance for this target population than it did for the pre-school-kindergarten teacher. The specifications suggest a careful and complete consideration of "Instructional Media and Mediated Instruction," "Programmed Instruction," "Computer Assisted Instruction," "Games and Simulation," "Microteaching," and "Research in Educational Technology." No area is slighted; all are stressed in the preparation of the modern elementary school teacher.

The specifications for the context of Research are essentially the same for the elementary teacher target population as they were for the pre-school-kindergarten teacher group. The general emphasis is on research dealing with teacher behavior, teacher characteristics, and media and innovations in teacher education. Prospective elementary teachers will become skilled in the techniques to assess and evaluate their behavior. The implication of such skill development is not only to aid the student in learning how to record and analyze his teaching behavior in his student teaching experiences but to continue such activity as a portion of his continuing education after he has entered the profession. The specifications on teacher characteristics have a similar purpose in helping students understand themselves and others as effective or ineffective teachers. The specifications on cross-cultural and cross-national characteristics suggest necessary personal and teaching experiences abroad which will help develop within teachers a world point of view on man and society. The basic concern of the specifications from the context of Research is to extend the knowledge and vision of teachers about themselves and teaching.

An analysis of the incidence of treatments, materials, and evaluations in Table 5 indicates a broad range of use and application, an activity centered program. Student involvement is apparent in cooperative activity, direct experience, discussions, individual study, observations, skill development, telling, simulation and demonstrations. These activities are varied and vital in the preparation of prospective teachers prepared to function in professional teams and to develop individualized programs for elementary pupils. The treatments provided suggest an orderly progression of experiences for students from observation, telling, discussions, and individual study to skill development, simulated activity, and demonstrations and then on to direct experience in classroom situations. The materials suggested in the specifications also run the complete spectrum of possibilities with audio-visual materials, books, printed materials (other than books), library materials, and laboratory materials heading the list. Examinations and reports are the two most frequently cited evaluation techniques, but conferences, observations, demonstrations, and special assignments are frequently suggested.

The pre-service elementary teacher model envisions prescription with flexibility and a different approach to teacher education than has usually been the case. The model is ambitious and innovative. The effort proposed not only attempts to meet educational change in the elementary school but to promote it.

## The In-Service Teachers Model.

### TABLE 6

### COMPOSITE SPECIFICATIONS FOR IN-SERVICE TEACHERS MODEL PROGRAM BY CONTEXT, SUBJECT AREA, AND TOPIC

| Context, Subject Area, Topic | | Total Numbers of Specifications |
|---|---|---|
| I. Instructional Organization | | 144 |
| Identifying numbers of the specifications | | |
| 1001-1003<br>1005-1037<br>1063-1067<br>1069-1075<br>1077-1079<br>1082-1084<br>1086-1094<br>1096-1106<br>1108-1112<br>1114-1117<br>1119<br>1123-1141<br>1145-1149<br>1151-1152<br>1156-1166<br>1173-1174<br>1176-1177<br>1179-1182<br>1184<br>1188<br>1190-1193<br>1195-1197<br>1202<br>1204<br>1206<br>1208-1210 | | |
| Necessary Training for Instruction | | 85 |
| Topics: 2. Curriculum Development and Evaluation | 3 | |
| 3. Academic Disciplines and Skills--Methodology | 60 | |
| 4. Evaluation Techniques for Multi-sized Group Instruction | 4 | |
| 5. Curriculum Techniques for Multi-sized Group Instruction | 7 | |
| 7. Internship | 11 | |
| Necessary Training for Research and Development | | 36 |
| Topics: 1. Types of Research and Formulation of Problem Statement and Hypotheses | 6 | |
| 2. Experimental Design and Implementation | 13 | |
| 3. Statistical Analysis of Experimental Data and Interpretation of Results | 2 | |
| 4. Testing and Development | 9 | |
| 5. Development-Based Research | 6 | |
| Multiunit Organization and Individually Guided Education | | 23 |
| Topics: 2. Organizational Structure and Functions | 9 | |
| 3. Roles and Responsibilities | 5 | |
| 4. Combination: Organizational Structure and Functions--Roles and Responsibilities | 9 | |

II. Educational Technology 85
Identifying numbers of the specifications

2001-2005
2009-2027
2029-2030
2032
2035-2047
2049-2053
2059-2067
2069-2073
2075-2078
2081-2087
2089-2096
2099-2105

| | | | | |
|---|---|---|---|---|
| Instructional Media and Mediated Instruction | | | | 18 |
| Topics: | 1. | Selection and Evaluation of Materials | 5 | |
| | 2. | Design and Construction of Materials | 4 | |
| | 3. | Utilization of Instructional Materials | 7 | |
| | 4. | Learning Resources Center | 2 | |
| Programmed Instruction | | | | 22 |
| Topics: | 1. | Sources of Instructional Programs and Program Development Information | 4 | |
| | 2. | Measurable Behavioral Objectives | 2 | |
| | 3. | Advantages and Disadvantages | 1 | |
| | 4. | Instructional Programs and Instructional Events | 2 | |
| | 5. | Principles of Programmed Instruction | 3 | |
| | 6. | Prompting | 1 | |
| | 7. | Learning Tasks Accomplished by Programmed Instruction | 2 | |
| | 8. | Student Performance Data | 3 | |
| | 9. | Teaching Machines | 1 | |
| | 10. | Instructional Program Development and Adaptation | 3 | |
| Computer Assisted Instruction | | | | 18 |
| Topics: | 1. | Elements of a CAI system | 2 | |
| | 2. | Applications of a Computer to Instruction | 2 | |
| | 3. | Advantages and Limitations of CAI | 2 | |
| | 4. | Pupil Performance Data | 3 | |
| | 5. | Development and Revision of Programs for a CAI System | 3 | |
| | 6. | Sources and Evaluation of CAI Systems and Programs | 3 | |
| | 7. | Operation of Equipment | 1 | |
| | 8. | Administration of a CAI System | 2 | |
| Instructional Simulation and Academic Games | | | | 17 |
| Topics: | 1. | Introduction | 6 | |
| | 2. | Selection | 2 | |
| | 3. | Utilization in Instruction | 5 | |
| | 4. | Evaluation | 2 | |
| | 5. | Modification and Design | 2 | |

| | | | |
|---|---|---|---|
| Micro-Teaching | | 5 | |
| Topics: 1. The Uses of Microteaching and Characteristics of Microteaching | 1 | | |
| 3. Participation in Microteaching | 4 | | |
| Research in Educational Technology | | 5 | |
| Topics: 1. Preliminary Study | 3 | | |
| 2. Basing the System on Research | 2 | | |
| III. Contemporary Learning-Teaching Process | | | 113 |

Identifying numbers of the specifications

3001-3006
3008-3015
3017-3019
3022-3024
3026-3034
3037-3040
3042-3057
3064-3066
3069-3070
3072-3074
3076
3078-3103
3112-3120
3123-3143

| | | | |
|---|---|---|---|
| Cognitive Domain | | 24 | |
| Topics: 1. Theories of Concept Learning | 6 | | |
| 2. Concept Formation | 9 | | |
| 3. Problem Solving | 5 | | |
| 4. Creativity | 4 | | |
| Affective Domain | | 11 | |
| Topics: 1. Attitudes and Values | 7 | | |
| 2. Personality Integration | 4 | | |
| Social Learning (Including Psychomotor Domain) | | 20 | |
| Topics: 1. Social Skills | 12 | | |
| 2. Psychomotor Skills | 8 | | |
| Basic Behavioral Operations | | 29 | |
| Topics: 1. Reinforcement | 8 | | |
| 2. Extinction | 9 | | |
| 3. Punishment | 4 | | |
| 4. Schedules of Reinforcement | 8 | | |
| Contingency Management | | 23 | |
| Topics: 1. Premack Principle | 2 | | |
| 2. Successive Approximations | 2 | | |
| 3. Task and Reinforcing Event Areas | 4 | | |
| 4. Reinforcing Event Menu | 2 | | |
| 5. Contract Apron | 1 | | |
| 6. Techniques for Automatic Contingency Management Generation | 1 | | |
| 7. Contingency Contracting | 8 | | |
| 8. Progress Checks | 3 | | |
| Self-Management | | 6 | |
| Topics: 1. Self-Contracting | 3 | | |
| 2. Contiguity Principle Applied to Self-Management | 2 | | |
| 3. Elimination of Undesirable Behavior | 1 | | |

## IV. Societal Factors 91

Identifying numbers of the specifications

4001
4003-4017
4026
4032
4037-4053
4079-4089
4099-4108
4110-4119
4138-4150
4153-4164

| | | | |
|---|---|---|---|
| Culture and Cultural Transmission | | | 18 |
| Topics: | 1. Enculturation | 6 | |
| | 2. Culture, Education, and Curriculum | 5 | |
| | 3. The Impact of Mass Media | 2 | |
| | 4. Discontinuity | 5 | |
| Social Stratification and Social Mobility | | | 17 |
| Topics: | 1. Social Stratification and Its Effect on Education | 9 | |
| | 2. Social Mobility | 5 | |
| | 3. Methods of Increasing Social Mobility | 3 | |
| Demographic Forces | | | 11 |
| Topics: | 1. Population Growth | 4 | |
| | 2. Geographic Mobility | 5 | |
| | 3. Population Distribution | 2 | |
| Cultural Change | | | 20 |
| Topics: | 1. Cultural Lag Problems in the School | 6 | |
| | 2. The Expanding Role of the School | 2 | |
| | 3. Modification of Educational Processes by Technology | 2 | |
| | 4. Theories of Social Change | 6 | |
| | 5. Response of Education to Socio-Cultural Change | 4 | |
| Social Control | | | 13 |
| Topics: | 1. Roles Within the School | 2 | |
| | 2. Role of Community Pressure Groups in Control of Education | 7 | |
| | 3. The Role of Federal, State, and Local Government in Control of Education | 1 | |
| | 4. The Role of Teacher Organizations in Control of Education | 1 | |
| | 5. The Effect of Religious Control on Education | 1 | |
| | 6. The Role of Industry in Control of Education | 1 | |
| Education as a Social Institution | | | 12 |
| Topics: | 1. Interactional Patterns | 5 | |
| | 2. Bureaucratic Hierarchy | 4 | |
| | 3. Career Patterns of Teachers | 2 | |
| | 4. Differential Standards That Affect the Status of the Profession | 1 | |

| | | | |
|---|---|---|---|
| V. Research | | | 77 |

Identifying numbers of the specifications

5001-5012
5014-5015
5040-5045
5055-5059
5098-5129
5135-5153
5178

| | | | |
|---|---|---|---|
| Research Reports | | 6 | |
| Topics: 1. Evaluating a Research Report | 3 | | |
| 2. Implementing the Findings of a Research Report | 3 | | |
| Research on Teacher Education Practices | | 5 | |
| Topics: 6. Development of the Multiunit School | 5 | | |
| Research on Teacher Characteristics | | 14 | |
| Topics: 1. Teacher Characteristics | 3 | | |
| 2. Attitudes | 2 | | |
| 3. Values, Interests, and Favored Activities | 2 | | |
| 5. Personality Factors | 2 | | |
| 6. Cognitive Abilities | 5 | | |
| Research on Teacher Behaviors | | 32 | |
| Topics: 1. Assessment of Teacher Behavior | 12 | | |
| 2. Interaction Analysis | 14 | | |
| 3. Evaluation of Teacher Behavior | 6 | | |
| Media and Innovations in Teacher Education | | 20 | |
| Topics: 1. Providing More Efficient Observation of Classroom Behavior | 9 | | |
| 2. Providing More Efficient Self-Instruction and Supervised Practice Experiences | 5 | | |
| 3. Providing a Direct Means of Presenting Teacher Education Courses | 2 | | |
| 4. Providing Better Standards of Teacher Performance | 2 | | |
| 5. Conducting Basic Research into Teaching and Learning Processes | 2 | | |
| Total Numbers of Specifications for In-Service Model | | | 510 |

## TABLE 7

### INCIDENCE OF TREATMENTS, MATERIALS, AND EVALUATIONS BY CONTEXT IN THE COMPOSITE SPECIFICATION FOR THE IN-SERVICE TEACHERS' MODEL PROGRAM.

| | Code Number | CONTEXT | | | | | |
|---|---|---|---|---|---|---|---|
| | | I | II | III | IV | V | Total |
| TREATMENT | 1 | 51 | 13 | 40 | 8 | 16 | 128 |
| | 2 | 14 | 25 | 16 | 13 | 3 | 71 |
| | 3 | 12 | 32 | 24 | 23 | 9 | 100 |
| | 4 | 62 | 29 | 37 | 19 | 38 | 185 |
| | 5 | 73 | 50 | 54 | 26 | 45 | 248 |
| | 6 | 32 | 12 | 25 | 29 | 26 | 124 |
| | 7 | 15 | 10 | 16 | 16 | 13 | 70 |
| | 8 | 8 | 27 | 41 | 17 | 23 | 116 |
| | 9 | 43 | 18 | 43 | 33 | 16 | 153 |
| | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11 | 3 | 3 | 0 | 0 | 0 | 6 |
| MATERIALS | 1 | 47 | 122 | 36 | 26 | 23 | 254 |
| | 2 | 92 | 57 | 86 | 84 | 63 | 383 |
| | 3 | 92 | 12 | 3 | 22 | 12 | 141 |
| | 4 | 22 | 8 | 13 | 5 | 42 | 90 |
| | 5 | 1 | 31 | 14 | 4 | 1 | 51 |
| | 6 | 1 | 2 | 11 | 0 | 1 | 15 |
| | 7 | 5 | 25 | 21 | 5 | 15 | 71 |
| | 8 | 2 | 10 | 1 | 2 | 0 | 15 |
| | 9 | 0 | 11 | 0 | 1 | 0 | 12 |
| | 10 | 7 | 0 | 0 | 0 | 3 | 10 |
| | 11 | 4 | 0 | 11 | 0 | 0 | 15 |
| | 12 | 24 | 28 | 14 | 4 | 2 | 72 |
| EVALUATION | 1 | 41 | 3 | 10 | 4 | 20 | 78 |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3 | 10 | 10 | 8 | 9 | 23 | 60 |
| | 4 | 47 | 38 | 56 | 17 | 20 | 178 |
| | 5 | 0 | 1 | 2 | 1 | 12 | 16 |
| | 6 | 12 | 17 | 27 | 17 | 3 | 76 |
| | 7 | 14 | 4 | 1 | 15 | 11 | 45 |
| | 8 | 0 | 0 | 0 | 1 | 1 | 2 |
| | 9 | 41 | 44 | 44 | 48 | 29 | 206 |
| | 10 | 2 | 2 | 5 | 4 | 1 | 14 |
| | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12 | 19 | 17 | 17 | 4 | 8 | 65 |
| | 13 | 1 | 0 | 0 | 0 | 0 | 1 |
| | 14 | 6 | 2 | 0 | 5 | 0 | 13 |

In-service teachers maintain a vital position both as professionals working to improve the educational program of elementary schools in which they are employed and as members of the instructional team of teacher education programs. For each of these tasks additional training is required. On one hand the target population requires retraining to participate in the reorganization of the school to fit multiunit guidelines and to implement the individualization of instruction through R & I Units. In addition, selected teachers will need preparation to assume the role required for assisting in the instruction of teacher trainees at all levels of involvement ranging from observation to full professional participation during internship and externship.

Admission to the in-service program would likely be determined on the basis of self-selection and employment in a participating school. No rigid criteria for selection other than certification as an elementary teacher would initially be practicable.

Normal progress and retention in the program is dependent on three factors. First, the in-service teacher must identify with a program of continuous growth as a necessary requirement for continuation in professional education. Second, the in-service teacher must be committed to such elements of the program as multiunit organization, research, individualization of instruction, and the development of a close working relationship between elementary schools and universities. Third, the in-service teacher must demonstrate the ability to develop competencies in the skills and knowledge vital to the model program. Failure to meet the requirements for normal progress in the in-service program would normally result in transfer to a school not participating in the teacher education program.

The composite specifications of the model program for the in-service teacher indicate a dual type of experience. With such components as research, new educational technology, multiunit organization, individually guided education and many other factors to be considered, a considerable amount of new knowledge must be gained by in-service personnel through some type of structured study. An examination of the specifications ordered for this target population in each of the five contexts reveals as many or more specifications required as were necessary for each of the two pre-service populations. In terms of a new and different approach to teacher education and an attempt to meet the instructional requirements of a modern elementary school program, the present typical elementary in-service teacher lacks the preparation, knowledge, and skills for the task. The answer to this difficulty is not to ignore it or attempt an in-service program of a limited, patch-work nature. The approach should be one of meeting the problem in a consistent manner which builds upon the present abilities of the in-service teacher and applies the principles of individualized instruction. The in-service teacher will need to meet the same specification requirements previously indicated for the preceding two pre-service populations and also be held for particular specifications applicable only to his group.

The sequencing of specifications for the in-service teacher population will be determined by the implementing school district and the cooperating college or university. A variety of sequencing patterns are possible which will consider a number of factors, such as the priority of in-service instructional needs and objectives, the time available for in-service activities, and the group and individualized instructional efforts desired.

The in-service instructional effort required suggests short term workshops and institutes for which various specifications would be sequenced, and individualized instruction during the school day in the classroom setting for the meeting of other specifications. The special purpose model program for in-service teachers on conducting research in the instructional setting discussed later in this chapter is an example of specification sequencing for this target population for particular objectives.

The sequencing of educational specifications for this in-service teacher preparation model is by context and all contexts are included. The greatest stress is on Instructional Organization, Contemporary Learning-Teaching Process and Societal Factors. Educational Technology and Research receive slightly less emphasis. However, all contexts are considered to have considerable importance.

The specifications for Instructional Organization cover the same ground as those previously reported for the two pre-service populations. A major effort will be to up-date in-service teachers on curriculum development and methodology in the four basic areas of the elementary school curriculum--language arts and reading, mathematics, social studies, and science. However, the principal emphasis will be to acquaint teachers with the multiunit school and the R & I Unit including the implications of this effort--multisized group instruction, individually guided education, research training, roles and responsibilities of various personnel in a team-teaching situation, evaluation techniques required, and the organization and administration necessary for the multiunit school. Much will need to be accomplished; the specifications indicate a major in-service education effort.

A similar re-education effort for the in-service teacher population is indicated in the specifications ordered for the Contemporary Learning-Teaching Process. The child-development courses taken as undergraduates will not provide in-service teachers with the necessary knowledge and skills to work as supervising teachers with pre-service trainees nor to conduct elementary school classrooms where contingency management is employed. The specifications call for a thorough review of topics covering the cognitive and affective domains and social and psychomotor skills. The subjects of "Basic Behavioral Operations," "Contingency Management," and "Self-Management" will be dealt with even more intensely.

Training for in-service personnel in the Societal Factors context is concentrated in problem solving and field research. The premise for such an approach is based upon the need for teachers to implement more effective interpersonal skills with pupils and other staff through a knowledge of the social milieu in the school in which they work. The importance of utilizing the tools of the "participant observer" for a more objective view of the social scene is imperative to assist in dealing with situations where children may have different values than the teacher. Therefore, the specifications require that in-service teachers conduct actual social research in the community where they teach. All subjects and topics for the context Societal Factors are included in the specifications indicated for the in-service teacher population.

The in-service teacher educational effort suggested by the specifications for the context Educational Technology is no less than that previously indicated for other contexts. Elementary teachers have long been know for their general reluctance to become involved intensively with various types of audio-visual devices, although the typical elementary classroom indicates teacher consideration of a variety of teaching materials. The specifications indicate a complete review of current instructional media and mediated instruction, but they go much further than this in terms of the other subjects to be considered in the context. In-service teachers are to be introduced to the materials and equipment needed and taught to become competent in the operations required in using programmed instruction, computer assisted instruction, games and simulations, and microteaching. A very considerable instructional effort is anticipated in this respect for this target population.

The final context of Research has the least number of specifications ordered for the in-service teacher group, but this does not suggest a slackening of instructional effort when considering this context. Rather, the specifications suggested are those considered most essential to the research re-education of the in-service teacher and those which this target population have the best opportunity to achieve under their employment circumstances. Consequently, the specifications are concentrated in the subjects of "Research Reports," "Research on Teacher Characteristics," "Research on Teacher Behaviors," and "Media and Innovations in Teacher Education." The effort contemplated is the preparation of an in-service teacher who can analyze, using modern observation and analysis techniques, his own behavior and characteristics as well as that of the pre-service student under his supervision. The only concern for research on teacher education practices involves the development of the multiunit school. Also, the in-service target population will not be held for cross-national research considerations, although the lack of inclusion of specifications in this area should not be interpreted as ruling out possible cross-national activities for in-service teachers. The principal concern of the research specifications ordered for in-service teachers is to enable them to become proficient in the assessment and analysis of teacher behavior for self-improvement in teaching personality and skills and to have the competence to help others in this same process.

Table 7 illustrates the incidence of specification treatments, materials, and evaluations by context for in-service teachers. Again, as with the pre-service populations, the results suggest various activities, a variety of materials, and the use of varied evaluation techniques in the conducting of an in-service teacher education program. The treatments suggested are rather evenly divided among those possible with individual study, as expected, receiving the most attention. The incidence of treatments suggested for the specifications clearly indicates the use of all types of activities for in-service teachers. The materials provided in the specifications for this population lean heavily to books, other printed materials, and audio-visual materials. This situation would be expected for a program of in-service education which stresses individual study. However, it should be noted that the incidence of use of other materials in the in-service population specifications is greater than that recorded for the same materials with either of the two pre-service populations. An examination of the results on evaluation techniques provides a similar picture. The specifications for in-service teachers stress examinations and reports but other types of evaluation methods are thought applicable and indicated.

The suggested program for the re-education of in-service teachers is extensive and comprehensive. A potential implementor may wish that this was not the case, but no other situation can be presented in terms of the retraining needed by thousands of elementary school teachers. The knowledge and skills demanded by a modern elementary school program are considerable. Add to this the needs required of in-service, supervising teachers in helping conduct an equally modern elementary teacher education program and the immense re-education effort indicated by the specifications for in-service teachers becomes self-evident.

In the very likely event that participation of in-service teachers in the complete program is prohibited by impelling local conditions, there is an alternative. It is possible to enter the population of specifications and tease out those most urgently needed according to the situational demands. This process is identical to that to be demonstrated in creating a special model program.

### The College and University Personnel Model.

TABLE 8

COMPOSITE SPECIFICATIONS FOR COLLEGE AND UNIVERSITY
PERSONNEL MODEL PROGRAM BY CONTEXT,
SUBJECT AREA, AND TOPIC

| | Context, Subject Area, Topic | Total Numbers of Specifications | | |
|---|---|---|---|---|
| 1. | Instructional Organization<br>Identifying numbers of the specifications | | | 79 |
| | 1041-1060 1073-1075 1194<br>1063-1067 1077-1098 1211-1215<br>1069-1071 1100-1119 | | | |
| | Necessary Training for Instruction | | 53 | |
| | Topics: 2. Curriculum Development and Evaluation | 3 | | |
| | 3. Academic Disciplines and Skills--Methodology | 50 | | |
| | Necessary Training for Research and Development | | 20 | |
| | Topics: 1. Types of Research and Formulation of Problem Statement and Hypotheses | 4 | | |
| | 2. Experimental Design and Implementation | 4 | | |
| | 3. Statistical Analysis of Experimental Data and Interpretation of Results | 3 | | |
| | 4. Testing and Development | 4 | | |
| | 5. Development-Based Research | 5 | | |
| | The Multiunit Organization and Individually Guided Education | | 6 | |
| | Topics: 3. Roles and Responsibilities | 1 | | |
| | 4. Combination: Organizational Structure and Functions--Roles and Responsibilities | 5 | | |
| II. | Educational Technology<br>Identifying numbers of the specifications | | | 93 |
| | 2001-2003 2028-2040 2069-2087<br>2009-2014 2042-2064 2089-2105<br>2016-2025 2066-2067 | | | |
| | Instructional Media and Mediated Instruction | | 23 | |
| | Topics: 1. Selection and Evaluation of Materials | 5 | | |
| | 2. Design and Construction of Materials | 3 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 3. | Utilization of Instructional Materials | 8 | | |
| | | 4. | Learning Resources Center | 7 | | |
| | Programmed Instruction | | | | 23 | |
| | Topics: | 1. | Sources of Instructional Programs and Program Development Information | 4 | | |
| | | 2. | Measurable Behavioral Objectives | 2 | | |
| | | 4. | Instructional Programs and Instructional Events | 2 | | |
| | | 5. | Principles of Programmed Instruction | 4 | | |
| | | 6. | Prompting | 1 | | |
| | | 7. | Learning Tasks Accomplished by Programmed Instruction | 2 | | |
| | | 8. | Student Performance Data | 2 | | |
| | | 9. | Teaching Machines | 1 | | |
| | | 10. | Instructional Program Development and Adaptation | 5 | | |
| | Computer Assisted Instruction | | | | 20 | |
| | Topics: | 1. | Elements of a CAI System | 2 | | |
| | | 2. | Applications of a Computer to Instruction | 2 | | |
| | | 3. | Advantages and Limitations of CAI | 2 | | |
| | | 4. | Pupil Performance Data | 2 | | |
| | | 5. | Development and Revision of Programs for a CAI System | 3 | | |
| | | 6. | Sources and Evaluation of CAI Systems and Programs | 4 | | |
| | | 7. | Operation of Equipment | 1 | | |
| | | 8. | Administration of a CAI System | 4 | | |
| | Instructional Simulation and Academic Games | | | | 19 | |
| | Topics: | 1. | Introduction | 6 | | |
| | | 2. | Selection | 2 | | |
| | | 3. | Utilization in Instruction | 5 | | |
| | | 4. | Evaluation | 4 | | |
| | | 5. | Modification and Design | 2 | | |
| | Microteaching | | | | 3 | |
| | Topics: | 1. | The Uses of Microteaching and Characteristics of Microteaching | 1 | | |
| | | 3. | Participation in Microteaching | 2 | | |
| | Research in Educational Technology | | | | 5 | |
| | Topics: | 1. | Preliminary Study | 3 | | |
| | | 2. | Basing the System on Research | 2 | | |
| III. | Contemporary Learning-Teaching Process | | | | | 96 |

Identifying numbers of the specifications

3001-3005
3007-3014
3017-3020
3022-3024
3026-3029

3031
3035-3037
3039
3041
3050

3056-3057
3062-3064
3067-3068
3071
3073

3075-3086
3088-3098
3101
3107-3115
3117-3119
3121-3130
3132-3137
3139-3141
3143

| | | | |
|---|---|---|---|
| Cognitive Domain | | | 26 |
| Topics: 1. | Theories of Concept Learning | 6 | |
| 2. | Concept Formation | 11 | |
| 3. | Problem Solving | 6 | |
| 4. | Creativity | 3 | |
| Affective Domain | | | 10 |
| Topics: 1. | Attitudes and Values | 7 | |
| 2. | Personality Integration | 3 | |
| Social Learning (Including Psychomotor Domain) | | | 17 |
| Topics: 1. | Social Skills | 11 | |
| 2. | Psychomotor Skills | 6 | |
| Basic Behavioral Operations | | | 27 |
| Topics: 1. | Reinforcement | 7 | |
| 2. | Extinction | 8 | |
| 3. | Punishment | 4 | |
| 4. | Schedules of Reinforcement | 8 | |
| Contingency Management | | | 11 |
| Topics: 1. | Premack Principle | 1 | |
| 2. | Successive Approximations | 2 | |
| 7. | Contingency Contracting | 5 | |
| 8. | Progress Checks | 3 | |
| Self-Management | | | 5 |
| Topics: 1. | Self-Contracting | 1 | |
| 2. | Contiguity Principle Applied to Self-Management | 2 | |
| 3. | Elimination of Undesirable Behavior | 1 | |
| 4. | Coverant Control | 1 | |

IV. Societal Factors 65

Identifying numbers of the specifications

4021
4023-4025
4027-4031
4033-4035
4063-4076
4093-4098
4124-4133
4135-4136
4138-4143
4146
4148-4149
4151-4162

| | | | |
|---|---|---|---|
| Culture and Cultural Transmission | | | 12 |
| Topics: 1. | Enculturation | 4 | |
| 2. | Culture, Education, and Curriculum | 3 | |
| 3. | The Impact of Mass Media | 2 | |
| 4. | Discontinuity | 3 | |

| | | | |
|---|---|---|---|
| | Social Stratification and Social Mobility | | 14 |
| Topics: 1. | Social Stratification and Its Effect on Education | 5 | |
| 2. | Social Mobility | 3 | |
| 3. | Methods of Increasing Social Mobility | 6 | |
| | Demographic Forces | | 6 |
| Topics: 1. | Population Growth | 2 | |
| 2. | Geographic Mobility | 2 | |
| 3. | Population Distribution | 2 | |
| | Cultural Change | | 12 |
| Topics: 1. | Cultural Lag Problems in the School | 4 | |
| 3. | Modification of Educational Processes by Technology | 2 | |
| 4. | Theories of Social Change | 2 | |
| 5. | Response of Education to Socio-Cultural Change | 4 | |
| | Social Control | | 11 |
| Topics: 1. | Roles Within the School | 2 | |
| 2. | Role of Community Pressure Groups in Control of Education | 6 | |
| 3. | The Role of Federal, State, and Local Government in Control of Education | 1 | |
| 5. | The Effect of Religious Control on Education | 1 | |
| 6. | The Role of Industry in Control of Education | 1 | |
| | Education as a Social Institution | | 10 |
| Topics: 1. | Interactional Patterns | 4 | |
| 2. | Bureaucratic Hierarchy | 3 | |
| 3. | Career Patterns of Teachers | 2 | |
| 4. | Differential Standards that Affect the Status of the Profession | 1 | |

V. Research — 116

Identifying numbers of the specifications

| | |
|---|---|
| 5018-5039 | 5156-5177 |
| 5048-5054 | |
| 5061-5125 | |

| | | | |
|---|---|---|---|
| | Research Reports | | 7 |
| Topics: 1. | Evaluating a Research Report | 3 | |
| 2. | Implementing the Findings of a Research Report | 4 | |

| | | | |
|---|---|---|---|
| Research on Teacher Education Practices | | | 37 |
| Topics: | 1. Function and Objectives of Teacher Education | 5 | |
| | 2. Admission, Retention and Recruitment in Teacher Education | 2 | |
| | 3. Organization and Administration of Teacher Education | 2 | |
| | 4. Curriculum in Teacher Education | 10 | |
| | 5. Instruction and Field Experience in Teacher Education | 3 | |
| | 6. Development of the Multiunit School | 5 | |
| | 7. Research on Teaching | 10 | |
| Research on Teacher Characteristics | | | 22 |
| Topics: | 1. Teacher Characteristics | 4 | |
| | 2. Attitudes | 4 | |
| | 3. Values, Interests, and Favored Activities | 3 | |
| | 4. Adjustment Needs | 1 | |
| | 5. Personality Factors | 3 | |
| | 6. Cognitive Abilities | 2 | |
| | 7. Cross-cultural and Cross-national Characteristics | 4 | |
| | 8. Projective Techniques | 1 | |
| Research on Teacher Behaviors | | | 28 |
| Topics: | 1. Assessment of Teacher Behavior | 12 | |
| | 2. Interaction Analysis | 12 | |
| | 3. Evaluation of Teacher Behavior | 4 | |
| Media and Innovations in Teacher Education | | | 22 |
| Topics: | 1. Providing More Efficient Observation of Classroom Behavior | 9 | |
| | 2. Providing More Efficient Self-Instruction and Supervised Practice Experiences | 3 | |
| | 3. Providing a Direct Means of Presenting Teacher Education Courses | 4 | |
| | 4. Providing Better Standards of Teacher Performance | 3 | |
| | 5. Conducting Basic Research into Teaching and Learning Processes | 3 | |
| Total Number of Specifications for College and University Personnel Model | | | 449 |

## TABLE 9

## INCIDENCE OF TREATMENTS, MATERIALS, AND EVALUATIONS BY CONTEXT IN THE COMPOSITE SPECIFICATIONS FOR THE COLLEGE AND UNIVERSITY PERSONNEL MODEL PROGRAM

| | | CONTEXT | | | | | |
|---|---|---|---|---|---|---|---|
| | Code Number | I | II | III | IV | V | Total |
| TREATMENT | 1 | 31 | 16 | 31 | 9 | 27 | 114 |
| | 2 | 15 | 27 | 11 | 10 | 1 | 64 |
| | 3 | 7 | 39 | 17 | 19 | 24 | 106 |
| | 4 | 23 | 28 | 30 | 10 | 55 | 146 |
| | 5 | 45 | 58 | 51 | 17 | 89 | 260 |
| | 6 | 9 | 16 | 19 | 22 | 17 | 83 |
| | 7 | 9 | 12 | 7 | 18 | 10 | 56 |
| | 8 | 1 | 32 | 35 | 8 | 30 | 106 |
| | 9 | 7 | 17 | 40 | 32 | 25 | 121 |
| | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11 | 2 | 3 | 0 | 0 | 2 | 7 |
| | | | | | | | |
| MATERIALS | 1 | 25 | 125 | 27 | 17 | 14 | 208 |
| | 2 | 63 | 62 | 82 | 61 | 104 | 372 |
| | 3 | 34 | 13 | 2 | 16 | 39 | 104 |
| | 4 | 15 | 8 | 9 | 5 | 102 | 139 |
| | 5 | 1 | 30 | 13 | 4 | 0 | 48 |
| | 6 | 1 | 6 | 8 | 0 | 4 | 19 |
| | 7 | 0 | 27 | 13 | 4 | 9 | 53 |
| | 8 | 0 | 8 | 1 | 0 | 0 | 9 |
| | 9 | 2 | 11 | 0 | 1 | 10 | 24 |
| | 10 | 5 | 0 | 2 | 0 | 6 | 13 |
| | 11 | 1 | 0 | 4 | 1 | 0 | 6 |
| | 12 | 11 | 33 | 12 | 6 | 1 | 63 |
| | | | | | | | |
| EVALUATION | 1 | 19 | 4 | 12 | 2 | 21 | 58 |
| | 2 | 0 | 0 | 1 | 0 | 1 | 2 |
| | 3 | 2 | 10 | 5 | 8 | 31 | 56 |
| | 4 | 12 | 40 | 48 | 12 | 36 | 148 |
| | 5 | 0 | 0 | 2 | 1 | 6 | 9 |
| | 6 | 6 | 18 | 17 | 11 | 2 | 54 |
| | 7 | 11 | 7 | 0 | 11 | 12 | 41 |
| | 8 | 1 | 0 | 0 | 0 | 2 | 3 |
| | 9 | 21 | 49 | 34 | 36 | 56 | 196 |
| | 10 | 2 | 1 | 9 | 3 | 0 | 15 |
| | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12 | 19 | 21 | 10 | 4 | 15 | 69 |
| | 13 | 1 | 0 | 0 | 0 | 0 | 1 |
| | 14 | 4 | 2 | 0 | 4 | 1 | 11 |

The college and university personnel population becomes one of the most important elements in a model elementary teacher education program since a certain amount of re-education of this group must occur prior to the implementation of the program for the other populations. For the most part, existing college and university faculties do not have the expertise nor the educational orientation necessary to implement the model teacher education program suggested. Hence, educational programs for this population need to be developed.

The new elementary teacher education program will require college and university personnel who are convinced that the traditional ways of preparing elementary teachers are for the most part obsolete. Also, they will need to be committed to the notion that the multiunit school with R & I Units (a team-teaching concept) will replace the self-contained classroom as the elementary school organizational structure.

Selected college and university personnel who elect to participate in the implementation of this teacher education program should have had some experience as elementary or pre-school teachers or at least exposure to elementary school children and activities. Since many of the activities which are prescribed by the programs for the other populations will take place in the elementary school, such prior experience will be helpful. The model programs call for an extremely close working relationship between the public schools and the universities. Additionally, it will be desirable for those conducting the program to have had experience in team teaching, and it will be essential for them to possess knowledge of basic research tools. College and university personnel who do not meet these pre-requisites will not be automatically excluded from the program. Such persons will, however, be required to participate in a more intensive education program than colleagues who meet the qualifications.

Rigid guidelines for selection and retention are not envisioned for entry or continuation of college and university personnel in the program. Generally, it will be a self-selection process for this target population. Individuals will be re-educated as long as they are willing to engage in programs which will help them acquire the knowledge and skills necessary to achieve the goals of the model elementary teacher education program.

It is recognized that the kind and amount of re-education will vary from one individual to another; hence, programs will be established according to the needs of the individual. Programs will be dictated by the skills which an individual possesses and by those needed to enable him to make a contribution to the preparation programs of the other target populations in the new elementary teacher education program.

The re-education of college and university personnel will involve some basic orientation and concepts necessary for all. However, most of the programs, as indicated above, will be individually tailored for individuals or small groups of individuals. Sequencing of specifications can then be done on the basis of individual needs, eliminating those already met and ordering the remainder according to group or individual activity.

Re-education programs for college and university personnel will not only vary in kind but also in duration. Most programs will be of a workshop nature and will involve the participant in short term, concentrated study. The treatment data indicate that over one-half of the activities will involve individual study. This is mandated by the fact that faculty members, for the most part, will require individualized programs.

The specifications also call for college and university personnel to engage in many cooperative activities during their re-education or reorientation programs. Direct experiences and simulated experiences of various types are also very important elements in the program. These experiences will be designed to "bridge the gap" between the college or university faculty member's original training and the skills and knowledge which he must acquire in order to implement this new elementary teacher education program.

The materials data indicate that this target population will acquire much of their new knowledge through reading and by the utilization of various kinds of audio-visual and laboratory materials. Information retrieval systems, such as ERIC, will provide the college and university personnel with much of the required new information. In addition to the published materials which will be used to retrain college and university personnel, there will be many source materials which will have to be developed specifically for the various retraining programs.

Participants in the reorientation program for college and university personnel are expected to meet the educational specifications which make up the program. The evaluation techniques involved in meeting the specifications utilize various methods such as conferences, demonstrations, observations, and special assignments with examinations and reports being most frequently called upon.

The educational specifications which have been developed for college and university personnel place a heavy emphasis on Research, including research methods, Educational Technology, and the Contemporary Learning-Teaching Process. The contexts of Instructional Organization and Societal Factors do not receive the attention which has previously been paid to these areas in the preceding model programs.

The large number of specifications ordered for this population in the context of Research is an indication that college and university personnel need to give more consideration to this context than has likely been the case in their previous professional activities. The research on teacher behaviors, teacher characteristics, teacher education practices, and media and innovation in teacher education is stressed. The concern is that the teachers of teachers be prepared to help their students assess and evaluate verbal and non-verbal behavior in the classroom to improve the students' teaching skills and style; that college and university personnel take more cognizance of students' intellectual and personal characteristics and the influence of these factors on teaching effectiveness. Another concern asks college and university personnel to have the knowledge and ability through research to improve teacher education practices and experiences in the college and elementary school setting for pre-service students.

In the Contemporary Learning-Teaching Process context, definite emphasis is placed on the areas of cognitive domain, affective domain, basic behavioral operations, social learning, and contingency management. The underlying assumption is that many college and university personnel with a strong child development background have not been adequately exposed to these areas in their prior education.

The context of Educational Technology receives a great deal of attention in the orientation of college and university personnel since this, too, would likely have been lacking in their original preparation. In this context emphasis is placed on instructional media and mediated instruction, programmed instruction, computer-assisted instruction and games and simulation. A consideration of microteaching is also included as this technique will be involved in working with pre-service students.

Reorientation programs in the context of Instructional Organization for college and university personnel will be designed to train them to prepare other personnel for careers in multiunit schools. Since knowledge of basic research tools is required for college and university personnel who participate in this program, many specifications in this context deal with the necessary training for research. Effort is also directed toward specifications concerned with academic disciplines and skills.

In the context Societal Factors, the greatest emphasis is on the subjects of "Culture and Cultural Transmission," "Cultural Change," "Social Control," "Social Stratification and Social Mobility," and "Education as a Social Institution." These areas, presumably, have not been adequately considered in present teacher education "foundations" courses; hence, the emphasis in the college and university personnel reorientation programs. A better understanding of cultural values and differences is required in teacher education programs concerning the American and world point of view on man and society.

In addition to utilizing the educational specifications to reorient college and university personnel, it is conceivable that institutions of higher education might develop total graduate programs around these specifications. Such programs could be used to prepare prospective college and university personnel to take employment in institutions where the new elementary teacher education programs were being implemented.

The Administrative Personnel Model:

## TABLE 10

### COMPOSITE SPECIFICATIONS FOR ADMINISTRATIVE PERSONNEL MODEL PROGRAM BY CONTEXT, SUBJECT AREA, AND TOPIC

| Context, Subject Area, Topic | Total Numbers of Specifications | | |
|---|---|---|---|
| I. Instructional Organization<br>Identifying numbers of specifications | | | 62 |
| 1006-1008<br>1010-1016<br>1018<br>1020<br>1022-1024<br>1031-1034<br>1038-1039<br>1040<br>1063-1064<br>1111<br>1119<br>1153-1155<br>1167-1171<br>1173-1174<br>1176-1177<br>1179-1184<br>1188-1198<br>1202<br>1204<br>1206<br>1208-1211 | | | |
| Necessary Training for Instruction | | 12 | |
| Topics: 2. Curriculum Development and Evaluation | 2 | | |
| 3. Academic Disciplines and Skills--Methodology | 2 | | |
| 6. The Administration of Individually Guided Education | 3 | | |
| 7. Internship | 5 | | |
| Necessary Training for Research and Development | | 22 | |
| Topics: 1. Types of Research and Formulation of Problem Statement and Hypotheses | 2 | | |
| 2. Experimental Design and Implementation | 9 | | |
| 3. Statistical Analysis of Experimental Data and Interpretation of Results | 1 | | |
| 4. Testing and Development | 3 | | |
| 5. Development-Based Research | 7 | | |
| The Multiunit Organization and Individually Guided Education | | 28 | |
| Topics: 2. Organizational Structure and Functions | 10 | | |
| 3. Roles and Responsibilities | 7 | | |
| 4. Combination: Organizational Structure and Functions--Roles and Responsibilities | 11 | | |

II. Educational Technology 70
Identifying numbers of specifications

2001-2002
2004
2006
2008-2022
2024-2025
2027
2029-2030
2032-2038
2044-2045
2047
2049-2050
2052-2055
2057-2061
2063-2065
2068-2069
2072-2075
2077
2081-2084
2086-2087
2090-2091
2093-2094
2097-2098
2101-2102
2105

Instructional Media and Mediated Instruction 15

| Topics: | | | |
|---|---|---|---|
| | 1. | Selection and Evaluation of Materials | 4 |
| | 3. | Utilization of Instructional Materials | 5 |
| | 4. | Learning Resources Center | 6 |

Programmed Instruction 22

| Topics: | | | |
|---|---|---|---|
| | 1. | Sources of Instructional Programs and Program Development Information | 4 |
| | 2. | Measurable Bahavioral Objectives | 2 |
| | 3. | Advantages and Disadvantages | 1 |
| | 4. | Instructional Programs and Instructional Events | 2 |
| | 5. | Principles of Programmed Instruction | 3 |
| | 6. | Prompting | 1 |
| | 7. | Learning Tasks Accomplished by Programmed Instruction | 1 |
| | 8. | Student Performance Data | 2 |
| | 9. | Teaching Machines | 1 |
| | 10. | Instructional Program Development and Adaptation | 5 |

Computer-Assisted Instruction 13

| Topics: | | | |
|---|---|---|---|
| | 1. | Elements of a CAI System | 2 |
| | 2. | Applications of a Computer to Instruction | 1 |
| | 3. | Advantages and Limitations of CAI | 2 |
| | 4. | Pupil Performance Data | 2 |
| | 5. | Development and Revision of Programs for a CAI System | 1 |
| | 6. | Sources and Evaluation of CAI Systems and Programs | 4 |
| | 8. | Administration of a CAI System | 1 |

Instructional Simulation and Academic Games 12

| Topics: | | | |
|---|---|---|---|
| | 1. | Introduction | 5 |
| | 2. | Selection | 1 |
| | 3. | Utilization in Instruction | 4 |
| | 4. | Evaluation | 2 |

| | | | |
|---|---|---|---|
| Microteaching | | | 5 |
| Topics: | 1. The Uses of Microteaching and Characteristics of Microteaching | 1 | |
| | 2. Arrangement of the Microteaching Situation | 1 | |
| | 3. Participation in Microteaching | 3 | |
| Research in Educational Technology | | | 3 |
| Topics: | 1. Preliminary Study | 2 | |
| | 2. Basing the System on Research | 1 | |

III. Contemporary Learning-Teaching Process 103
Identifying numbers of the specifications

3001-3006
3008-3014
3017-3019
3022-3024
3026-3030
3032
3034
3037
3039
3042-3053
3058-3061
3064-3065
3069
3071-3074
3076
3078-3098
3104-3106
3112-3115
3117-3119
3123-3141
3143

| | | | |
|---|---|---|---|
| Cognitive Domain | | | 21 |
| Topics: | 1. Theories of Concept Learning | 6 | |
| | 2. Concept Formation | 8 | |
| | 3. Problem Solving | 4 | |
| | 4. Creativity | 3 | |
| Affective Domain | | | 11 |
| Topics: | 1. Attitudes and Values | 7 | |
| | 2. Personality Integration | 4 | |
| Social Learning (Including Psychomotor Domain) | | | 19 |
| Topics: | 1. Social Skills | 12 | |
| | 2. Psychomotor Skills | 7 | |
| Basic Behavioral Operations | | | 26 |
| Topics: | 1. Reinforcement | 7 | |
| | 2. F[illegible]ion | 7 | |
| | 3. [illegible]nment | 4 | |
| | 4. Schedules of Reinforcement | 8 | |
| Contingency Management | | | 20 |
| Topics: | 1. Premack Principle | 1 | |
| | 2. Successive Approximations | 1 | |
| | 3. Task and Reinforcing Event Areas | 4 | |
| | 4. Reinforcing Event Menu | 2 | |
| | 5. Contract Apron | 1 | |
| | 6. Techniques for Automatic Contingency Management Generation | 1 | |
| | 7. Contingency Contracting | 8 | |
| | 8. Progress Checks | 2 | |

| | | | | |
|---|---|---|---|---|
| | Self-Management | | 6 | |
| | Topics: 1. Self-Contracting | 3 | | |
| | 2. Contiguity Principle Applied to Self-Management | 2 | | |
| | 3. Elimination of Undesirable Behavior | 1 | | |
| IV. | Societal Factors | | | 126 |
| | Identifying numbers of the specifications | | | |

4001
4003-4019
4026
4037-4057
4063-4092
4099-4123
4134
4138-4154
4156-4168

| | | |
|---|---|---|
| Culture and Cultural Transmission | | 19 |
| Topics: 1. Enculturation | 5 | |
| 2. Culture, Education, and Curriculum | 7 | |
| 3. The Impact of Mass Media | 2 | |
| 4. Discontinuity | 5 | |
| Social Stratification and Social Mobility | | 37 |
| Topics: 1. Social Stratification and Its Effect on Education | 16 | |
| 2. Social Mobility | 10 | |
| 3. Methods of Increasing Social Mobility | 11 | |
| Demographic Forces | | 14 |
| Topics: 1. Population Growth | 4 | |
| 2. Geographic Mobility | 8 | |
| 3. Population Distribution | 2 | |
| Cultural Change | | 26 |
| Topics: 1. Cultural Lag Problems in the School | 8 | |
| 2. The Expanding Role of the School | 3 | |
| 3. Modification of Educational Processes by Technology | 2 | |
| 4. Theories of Social Change | 8 | |
| 5. Response of Education to Socio-Cultural Change | 5 | |
| Social Control | | 15 |
| Topics: 1. Roles Within the School | 2 | |
| 2. Role of Community Pressure Groups in Control of Education | 9 | |
| 3. The Role of Federal, State, and Local Government in Control of Education | 1 | |
| 4. The Role of Teacher Organizations in Control of Education | 1 | |
| 5. The Effect of Religious Control on Education | 1 | |
| 6. The Role of Industry in Control of Education | 1 | |

| | | | | |
|---|---|---|---|---|
| | Education as a Social Institution | | 15 | |
| Topics: | 1. Interactional Patterns | 8 | | |
| | 2. Bureaucratic Hierarchy | 4 | | |
| | 3. Career Patterns of Teachers | 2 | | |
| | 4. Differential Standards that Affect the Status of the Profession | 1 | | |
| V. | Research | | | 77 |

Identifying numbers of the specifications

5001-5012
5014
5016-5017
5040-5044
5046-5047
5055-5060
5098-5117
5122-5125
5130-5151
5154-5155
5178

| | | | |
|---|---|---|---|
| | Research Reports | | 7 |
| Topics: | 1. Evaluating a Research Report | 3 | |
| | 2. Implementing the Findings of a Research Report | 4 | |
| | Research on Teacher Education Practices | | 6 |
| Topics: | 6. Development of the Multiunit School | 6 | |
| | Research on Teacher Characteristics | | 15 |
| Topics: | 1. Teacher Characteristics | 4 | |
| | 2. Attitudes | 2 | |
| | 3. Values, Interests, and Favored Activities | 2 | |
| | 5. Personality Factors | 2 | |
| | 6. Cognitive Abilities | 5 | |
| | Research on Teacher Behaviors | | 29 |
| Topics: | 1. Assessment of Teacher Behavior | 13 | |
| | 2. Interaction Analysis | 9 | |
| | 3. Evaluation of Teacher Behavior | 7 | |
| | Media and Innovation in Teacher Education | | 20 |
| Topics: | 1. Providing More Efficient Observation of Classroom Behavior | 8 | |
| | 2. Providing More Efficient Self-Instruction and Supervised Practice Experiences | 5 | |
| | 3. Providing a Direct Means of Presenting Teacher Education Courses | 2 | |
| | 4. Providing Better Standards of Teacher Performance | 3 | |
| | 5. Conducting Basic Research into Teaching and Learning Processes | 2 | |

Total Number of Specifications for Administrative Personnel Model 438

## TABLE 11

## INCIDENCE OF TREATMENTS, MATERIALS, AND EVALUATIONS BY CONTEXT IN THE COMPOSITE SPECIFICATION FOR ADMINISTRATIVE PERSONNEL MODEL PROGRAM

| | | CONTEXT | | | | | |
|---|---|---|---|---|---|---|---|
| | Code Number | I | II | III | IV | V | Total |
| TREATMENT | 1 | 27 | 13 | 33 | 17 | 21 | 111 |
| | 2 | 2 | 22 | 13 | 19 | 2 | 58 |
| | 3 | 5 | 27 | 19 | 42 | 11 | 104 |
| | 4 | 33 | 23 | 34 | 23 | 35 | 148 |
| | 5 | 36 | 45 | 53 | 39 | 47 | 220 |
| | 6 | 14 | 13 | 25 | 42 | 21 | 115 |
| | 7 | 3 | 7 | 15 | 29 | 13 | 67 |
| | 8 | 0 | 22 | 38 | 22 | 21 | 103 |
| | 9 | 25 | 17 | 41 | 53 | 14 | 150 |
| | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11 | 0 | 1 | 0 | 0 | 1 | 2 |
| MATERIALS | 1 | 28 | 93 | 35 | 32 | 18 | 206 |
| | 2 | 26 | 54 | 82 | 130 | 61 | 353 |
| | 3 | 89 | 11 | 2 | 33 | 16 | 111 |
| | 4 | 8 | 6 | 13 | 6 | 39 | 72 |
| | 5 | 1 | 22 | 13 | 6 | 1 | 43 |
| | 6 | 0 | 5 | 11 | 0 | 2 | 18 |
| | 7 | 1 | 17 | 18 | 11 | 19 | 66 |
| | 8 | 2 | 8 | 1 | 2 | 0 | 13 |
| | 9 | 0 | 8 | 0 | 2 | 1 | 11 |
| | 10 | 2 | 0 | 0 | 0 | 3 | 5 |
| | 11 | 0 | 0 | 5 | 1 | 0 | 6 |
| | 12 | 11 | 19 | 12 | 10 | 2 | 54 |
| EVALUATION | 1 | 32 | 4 | 8 | 4 | 18 | 66 |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3 | 2 | 8 | 8 | 14 | 25 | 57 |
| | 4 | 22 | 33 | 53 | 23 | 19 | 150 |
| | 5 | 0 | 0 | 2 | 2 | 13 | 17 |
| | 6 | 4 | 13 | 19 | 26 | 5 | 67 |
| | 7 | 3 | 5 | 1 | 26 | 12 | 47 |
| | 8 | 0 | 0 | 0 | 1 | 1 | 2 |
| | 9 | 17 | 38 | 38 | 74 | 26 | 193 |
| | 10 | 1 | 1 | 7 | 10 | 2 | 21 |
| | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12 | 9 | 10 | 16 | 5 | 8 | 48 |
| | 13 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 14 | 1 | 1 | 0 | 9 | 0 | 11 |

The implementation of the specifications of the teacher education program requires a definitely different role of the administrator than is presently the case. It will be necessary for administrators to undergo an extensive reorientation program. This is illustrated by the fact that over 50 per cent of the specifications apply to the administrative population. An initial reaction might be that the multiunit elementary school organization is the major factor in requiring this change of role for the administrator. To some extent this may be true, however, the remaining four contextual areas also require extensive re-education of the administrator, different from that usually found in the present preparation programs for administrators.

The program for administrative personnel as developed in this project has the following requirements for admission:

(1) The individual holds at least a bachelor's degree.
(2) The individual is a practicing or prospective elementary school principal.

These two requirements are minimal and mean in essence that we would admit practicing administrators to the program. However, admission does not guarantee completion of, or even extensive participation in, the program. This may seem somewhat severe, but the administrator is a key individual and for the successful operation of a multiunit school it is imperative that he possess certain knowledge and skills. Successful completion of the program will require that the individual demonstrate that he can function successfully as the instructional leader of a school. The individual must be favorable toward conducting research in the instructional setting and implementing change for educational improvement. The principal must be able to work well with people and be able to provide effective leadership for groups such as the instructional improvement committee of his school. Progress in the program will be based upon the successful performance of actual tasks, behaviorally described, rather than on length of tenure either in the program or in the school system.

At this point let us consider in greater detail some of the characteristics of the program for administrators. The instructional organization of a multiunit school requires that the school principal be operationally much more of an instructional leader than is presently the case. The administrator will be required not only to be an instructional leader but the instructional leader of a multiunit school. This will require the administrator to secure considerable background information about the organization and operation of a multiunit school, information that is presently not in the repertoire of many administrators. An inspection of the specifications in the context Instructional Organization reveals that the administrator must be able to participate in curriculum development, research development and its implementation, and systematic evaluation for the effectiveness of the multiunit school. The administrator must understand the multiunit organization; how it fits into the school with all its components, functions and personnel. The administrator will be required to understand the roles of not only his teachers but of supportive personnel such as aides and teachers-in-training such as interns and student teachers.

An inspection of the specification treatments for the context Instructional Organization reveal a considerable amount of lecture, discussion, and cooperative activity. These are necessary for the administrator to secure the necessary basic information. The specifications reveal experiences other than the usual practicum-type, exchange-of-experience-type activities so often found in training programs for administrators. The training program for meeting these specifications does not consist of ad hoc procedures for the day-to-day operation of the school. A considerable amount of the basic knowledge required of administrators will be secured through individual study with, of course, appropriate direction. Simulation and observation also play an important role in the program. There will also be direct experience in a multiunit school. In fact, the practicing administrator will concurrently be working on the development of his own school in the multiunit organization.

The context of Educational Technology, as with all the contexts in terms of the program for administrators, requires a considerable amount of knowledge new to most educators. In order to effectively incorporate mediated instruction, instructional technology, and the like, in the multiunit school the administrator will be required to secure basic knowledge about these materials as well as the planning and organization of programs related to the materials and equipment. Educational technology does not function in a vacuum and correspondingly it will be the responsibility of the principal to understand the role that educational technology will play in the school and how it will be incorporated into curriculum activities. An inspection of the treatment of the specifications in this context reveals the involvement of a considerable amount of equipment accompanied with lecture-discussion activity as well as the actual preparation of plans and designs.

The successful administrator of a multiunit school will be required to have considerable in-depth training in what we generally consider to be educational psychology. The reader should note the emphasis of in-depth training rather than a superficial knowledge and vague familiarity with terminology in this discipline. An inspection of the specifications reveals that they include, for the most part, concepts which may not have been included in the administrator's previous training. Again we encounter the heavy emphasis upon the acquisition of basic knowledge. An inspection of the treatments of the specifications reveals considerable lecture-discussion and individual study. The Contemporary Learning-Teaching Process specifications applicable to the administrator population, demand an administrator who understands basic knowledge of the learning-teaching process.

The requirements of the administrator relevant to the context Societal Factors demand considerable basic education in educational sociology relative to the society in which the school functions. The specifications imply preparing the administrator as a practicing quasi-educational sociologist. Included are the awareness, identifications, and descriptions of real problems existing in the school community. Inspection of the treatments of the specifications reveals approaches to solving real problems. The specifications include the systematic approach for training administrators for dealing with such problems. Again, as in the case of the other contexts, the administrators will be required to secure considerable knowledge that administrators may not now possess. It will be impossible for a practicing administrator in a multiunit school to avoid involvement in problems dealing with the various sociological and societal factors such as the subcultures among elementary pupils.

The preparation of the administrator relative to societal factors will not be strictly a lecture-discussion approach although this is a very important component of the treatments. The program will also involve role playing and structured-type situations. Some of these situations will include the immediate review of videotape so that the administrator can, in fact, view his own reactions to various situations and participation in certain activities. The treatments also include activities such as visits to communities and conducting corresponding interviews.

The context Research requires that the administrator know how to perform and report valid research. Therefore, administrators not possessing a background in basic concepts of conducting research in the instructional setting will be required to secure this basic knowledge. In addition to knowing how research is done in the instructional setting the administrator must be familiar with factors such as the cost and organization of actually implementing research in his school. Since the use of research on teacher characteristics and behaviors is to be operationally utilized for the continuous improvement of teaching in the instructional organization, the administrator will be required to take the leadership for implementing such research in his school. In order to take such leadership effectively, the treatments indicated by the specifications are heavily oriented toward individual study, lecture, and the use of appropriate videotapes.

The point has been made throughout this discussion that the administrator will require basic knowledge and information in several areas in order to meet, successfully, the specifications of this project. This is an attempt to get away from the ad hoc experience type of administration found in many elementary schools today. The administrator, rather than operating his school in ad hoc fashion, will operate in more of a context of organization and management. He will actually take on the role of instructional leader as someone who is intimately involved in the internal operations of the instructional program.

The sequencing of the specifications for this population as in the other populations was according to the context, subject area and topic breakdown. This is a logical and applicable way in which to sequence objectives. However, in the case of the administrator it is unlikely that administrators can be removed from their schools for extended periods of time to participate exclusively in a re-education program. A more feasible way to approach the reorientation of administrators is through the establishment of self-contained programs with limited objectives which cover a part of the overall program. If such procedures are used, the sequencing of objectives will likely follow such factors as types of activities rather than the contextual breakdown presented here. Substantial portions of the necessary training from each of the five contexts will most efficiently take place concurrently. Therefore, a partial program might be built around the activities that actually take place in the school and community setting. For example, selected specifications dealing with societal factors, necessary research training and research on teacher behaviors would have these types of components in them. Objectives in a program might be sequenced according to stages indicated earlier, namely the three stages of cognition, simulation and operation.

The specifications for the administrator population might impress the reader as comprising an overwhelming and essentially impossible task.

Obviously, preparing administrators to function effectively within multiunit schools and dynamic communities as instructional leaders is an ambitious task. However, it is not anticipated that the reorientation will take place overnight. Neither will all administrators and all programs progress at the same rate. Not all administrators will require all of the experiences implied in the specifications. Some of them may have secured segments of the necessary academic training through previous educational experiences or through participation in recent experimental programs. As with the pre-service and in-service populations, the programs ordered will be tailored to the needs of the specific administrators under consideration.

The awarding of advanced degrees or special certificates for successful completion of the program will be at the option of the implementing institution. There should be no undue difficulty in incorporating at least segments of the model program for administrators into degree programs. What is needed is a flexible and fresh view toward the training of administrators for the instructional leadership role. Any institution implementing the specification should be willing to take such a view.

## TABLE 12

## COMPOSITE SPECIFICATIONS FOR SUPPORTIVE PERSONNEL MODEL PROGRAM BY CONTEXT, SUBJECT, AREA, AND TOPIC

| I. | Context, Subject Area, Topic | Total Numbers of Specifications | | |
|---|---|---|---|---|
| I. | Instructional Organization<br>Identifying numbers of the specifications | | | 22 |
| | 1016<br>1061<br>1075<br>1077<br>1079<br>1086<br>1087<br>1089<br>1096<br>1099<br>1100<br>1111<br>1082<br>1216-1224 | | | |
| | Necessary Training for Instruction | | 10 | |
| | Topics: 3. Academic Disciplines and Skills--Methodology | 10 | | |
| | Necessary Training for Research and Development | | 2 | |
| | Topics: 2. Experimental Design and Implementation | 1 | | |
| | 3. Statistical Analysis of Experimental Data and Interpretation of Results | 1 | | |
| | The Multiunit Organization and Individually Guided Education | | 10 | |
| | Topics: 2. Organizational Structure and Functions | 1 | | |
| | 5. Basic Pattern of the Multiunit Elementary School | 1 | | |
| | 6. Pupil Behavior | 2 | | |
| | 7. Qualifications of the Teacher Aide | 1 | | |
| | 8. Functions of the Teacher Aide | 5 | | |
| II. | Educational Technology<br>Identifying numbers of the specifications | | | 71 |
| | 2001-2002<br>2004<br>2006-2019<br>2021-2022<br>2024-2025<br>2027<br>2030<br>2032<br>2035-2039<br>2042-2050<br>2052-2056<br>2059-2060<br>2065<br>2067-2068<br>2076-2087<br>2089-2095<br>2097<br>2101-2102<br>2105<br>[illegible]<br>[illegible]<br>[illegible]<br>[illegible]<br>[illegible] | | | |

| | | | |
|---|---|---|---|
| Instructional Media and Mediated Instruction | | 19 | |
| Topics: 1. Selection and Evaluation of Materials | 5 | | |
| 2. Design and Construction of Materials | 2 | | |
| 3. Utilization of Instructional Materials | 7 | | |
| 4. Learning Resources Center | 5 | | |
| Programmed Instruction | | 18 | |
| Topics: 1. Sources of Instructional Programs and Program Development Information | 4 | | |
| 2. Measurable Behavioral Objectives | 2 | | |
| 3. Advantages and Disadvantages | 1 | | |
| 4. Instructional Programs and Instructional Events | 2 | | |
| 5. Principles of Programed Instruction | 2 | | |
| 6. Prompting | 1 | | |
| 7. Learning Tasks Accomplished by Programmed Instruction | 1 | | |
| 8. Student Performance Data | 2 | | |
| 9. Teaching Machines | 1 | | |
| 10. Instructional Program Development and Adaptation | 2 | | |
| Computer-Assisted Instruction | | 10 | |
| Topics: 1. Elements of a CAI System | 2 | | |
| 4. Pupil Performance Data | 3 | | |
| 7. Operation of Equipment | 1 | | |
| 8. Administration of a CAI System | 4 | | |
| Instructional Simulation and Academic Games | | 15 | |
| Topics: 1. Introduction | 6 | | |
| 2. Selection | 2 | | |
| 3. Utilization in Instruction | 5 | | |
| 4. Evaluation | 2 | | |
| Microteaching | | 6 | |
| Topics: 1. The Uses of Microteaching and Characteristics of Microteaching | 1 | | |
| 2. Arrangement of the Microteaching Situation | 2 | | |
| 3. Participation in Microteaching | 3 | | |
| Research in Educational Technology | | 3 | |
| Topics: 1. Preliminary Study | 2 | | |
| 2. Basing the System on Research | 1 | | |
| IV. Societal Factors | | | 28 |

Identifying numbers of specifications

4020
4022
4035
4037-4053
4058-4062
4135-4137
4169

| | | |
|---|---|---|
| Culture and Cultural Transmission | | 2 |
| Topics: 2. Culture, Education, and Curriculum | 2 | |
| Social Stratification and Social Mobility | | 22 |
| Topics: 1. Social Stratification and Its Effect on Education | 11 | |
| 2. Social Mobility | 5 | |
| 3. Methods of Increasing Social Mobility | 6 | |
| Cultural Change | | 3 |
| Topics: 3. Modification of Educational Processes by Technology | 1 | |
| 4. Theories of Social Change | 1 | |
| 5. Response of Education to Socio-Cultural Change | 1 | |
| Education as a Social Institution | | 1 |
| Topics: 1. Interactional Patterns | 1 | |
| Total Number of Specifications for Supportive Personnel Model | | 121 |

# TABLE 13

## INCIDENCE OF TREATMENTS, MATERIALS AND EVALUATIONS BY CONTEXT IN THE COMPOSITE SPECIFICATION FOR THE SUPPORTIVE PERSONNEL MODEL PROGRAM

| | | CONTEXT | | | | | |
|---|---|---|---|---|---|---|---|
| | Code Number | I | II | III | IV | V | Total |
| TREATMENT | 1 | 7 | 11 | 0 | 2 | 0 | 20 |
| | 2 | 5 | 24 | 0 | 4 | 0 | 33 |
| | 3 | 2 | 28 | 0 | 5 | 0 | 35 |
| | 4 | 5 | 24 | 0 | 5 | 0 | 34 |
| | 5 | 11 | 44 | 0 | 9 | 0 | 64 |
| | 6 | 6 | 16 | 0 | 12 | 0 | 34 |
| | 7 | 6 | 11 | 0 | 5 | 0 | 22 |
| | 8 | 3 | 19 | 0 | 10 | 0 | 32 |
| | 9 | 7 | 17 | 0 | 13 | 0 | 37 |
| | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11 | 0 | 2 | 0 | 0 | 0 | 2 |
| MATERIALS | 1 | 10 | 95 | 0 | 9 | 0 | 114 |
| | 2 | 12 | 48 | 0 | 25 | 0 | 85 |
| | 3 | 10 | 8 | 0 | 5 | 0 | 23 |
| | 4 | 0 | 8 | 0 | 1 | 0 | 9 |
| | 5 | 1 | 28 | 0 | 1 | 0 | 30 |
| | 6 | 1 | 6 | 0 | 0 | 0 | 7 |
| | 7 | 3 | 18 | 0 | 1 | 0 | 22 |
| | 8 | 0 | 8 | 0 | 0 | 0 | 8 |
| | 9 | 0 | 9 | 0 | 0 | 0 | 9 |
| | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12 | 9 | 23 | 0 | 2 | 0 | 34 |
| EVALUATION | 1 | 10 | 2 | 0 | 0 | 0 | 12 |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 7 | 0 | 2 | 0 | 9 |
| | 4 | 7 | 35 | 0 | 4 | 0 | 46 |
| | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6 | 2 | 13 | 0 | 9 | 0 | 24 |
| | 7 | 3 | 2 | 0 | 4 | 0 | 9 |
| | 8 | 0 | 0 | 0 | 1 | 0 | 1 |
| | 9 | 6 | 37 | 0 | 9 | 0 | 52 |
| | 10 | 0 | 2 | 0 | 4 | 0 | 6 |
| | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 12 | 1 | 11 | 0 | 1 | 0 | 13 |
| | 13 | 1 | 0 | 0 | 0 | 0 | 1 |
| | 14 | 0 | 2 | 0 | 0 | 0 | 2 |

Individuals selected to be trained as supportive personnel will undoubtedly manifest a wide range of socio-cultural backgrounds. Perhaps this is what prompted Reisman and Pearl to describe this kind of occupation as a "new career." Although some programs of similar nature refer to such people as teacher aides or paraprofessionals, the term "supportive personnel" is well chosen because of the fact that individuals trained in this segment of the program will act in support of not just the teacher, but will often work in concert with all members of the professional staff including teacher, administrator, and elementary school specialist. Furthermore, supportive personnel will have a degree of autonomy that will permit them to work independently in tasks designed to augment various professional activities. The complexity of some of the tasks demand that these persons be more than volunteers from the neighborhood who come in and count lunch money or attempt the direction of a story-telling circle.

The specifications ordered for this target population suggest that various types of paraprofessionals will be needed with varying abilities and training. Some types of paraprofessionals, such as those with computer programmer skills, would need formal training beyond high school while others would come directly from high school and be trained on-the-job. Requirements for admittance to a supportive personnel training program would vary with the type of paraprofessional desired although general literacy and on-the-job performance would be minimum factors. Retention in the supportive personnel program would depend upon a variety of elements depending upon the type of paraprofessional being prepared. However, adequate completion of assigned tasks and dependability would probably be two means by which all supportive personnel would be evaluated by the professional educators with whom they will work.

Although specifications for supportive personnel appear in only three contexts, Instructional Organization, Societal Factors, and Educational Technology, it should not be assumed that this target population is somehow depreciated. It is within these three contexts that the activities and skills of supportive personnel are in greatest demand, and such persons perform a wide range of tasks that make their role paramount for the successful completion of other educational roles. Further, the limiting of specifications to three contexts (none in Learning-Teaching Process or Research) indicate the position that supportive personnel are to be trained to support teachers and not to take over their teaching functions. Support in this respect means aiding teachers in tasks which teachers should no longer have to perform or where help is needed in the performance of the task. It does not mean taking over the teaching role from the teacher.

Efforts were made within a given context to order the specifications from simple to more complex tasks; from basic knowledges to more complex operations. For example, in Educational Technology, the student would first learn where to acquire programmed materials, then upon reception of such materials he would organize them in such a fashion that their utilization would be facilitated. Supportive personnel would also be expected to perform tasks connected with data processing, computer assisted instruction, gaming and simulation. A major responsibility for supportive personnel would be the acquisition, care and cleaning, and distribution of various pieces of audio-visual equipment. They would make equipment available to teachers and assist in operation when necessary.

In the context of Instructional Organization the supportive person would be instructed in the acquisition and ordering of instructional materials for the various elementary school subject matter areas and in establishing them in some kind of learning center such as a mathematics laboratory. Since supportive personnel will assist the teacher in play activities, they will need to understand not only how to organize games but will need to understand basic fundamentals of first aid.

The overriding concern in Instructional Organization, however, is the ability of supportive personnel to function effectively within the multiunit structure of the school. In order to do this, this target population will be taught the organization and operation of the R & I Unit and how they can work cooperatively with other members of a team. For example, they will be given the opportunity to work as instructional assistants with children in individually guided education as well as working with a teacher in setting up a research project by perhaps ordering and distributing testing materials and keeping pupil progress records.

The Societal Factors context involves supportive personnel in assisting other professional personnel in achieving a better understanding of the culture of the school in a given social setting. Gathering information on the social structure and mobility of people within the community and keeping records on such facts ought to be indispensable aids to facilitate teacher-pupil interaction. One might compare the role of supportive personnel to that of field research assistants. The relationship here to the training on computers is obvious -- supportive personnel can program information gleaned from the field and through the use of the computer and careful organization of the data provide teachers and administrators with a multitude of facts to facilitate instruction.

The enumeration of the actual obligations of supportive personnel could continue *ad infinitum* and still omit some important activities. The training program will somehow need to equip these persons to adapt readily to a wide variety of school situations so that they will be able to function effectively wherever they are employed.

## Application of the Process for a Special Purpose Model Program.

The discussion of this section is provided for the purposes of illustrating the application of the process for a model program other than the six developed for entire populations, earlier in this chapter. Any of a large number of possible programs could have been selected. The model program discussed represents a sort of "median" between programs of several years duration and very short term programs of only two or three weeks.

Suppose that working cooperatively toward multiunit elementary schools, university and public school personnel decide that additional research training is necessary for teachers teaching in R & I Units. At this point the population is already identified, namely in-service teachers. A model program is now desired for meeting the general goal of preparing in-service teachers for conducting research in the instructional setting. From this general goal we develop more specific objectives. Suppose we provide the anticipated program with a name and list the general goal and specific objectives.

### Research Training for In-Service Teachers Conducting Research in the Instructional Setting

General Goal:

To provide in-service teachers with training in research methods in order for them to participate effectively in research activities of a multiunit elementary school.

Specific Objectives: (all apply to the defined population for the program)

1. To provide a knowledge of stating research problems and formulating hypotheses.
2. To provide an understanding of experimentation in the instructional setting.
3. To develop and illustrate the basic concepts of conducting research in the instructional setting.
4. To provide research information about selected topics, such as research in educational technology, that apply directly to the instructional setting.
5. To develop an understanding of how to implement research findings in the instructional setting.
6. To provide basic information about effectively reading and writing research reports.
7. To develop the role of research in the R & I Unit organization.

The number of specific objectives included is the decision of the individual developing the model program. The important thing is that the specific objectives provide adequate direction so that necessary topics can be selected and the corresponding specifications identified.

On the basis of the specific objectives for the model program under consideration, the following topics and their corresponding specifications are identified. The topics are grouped according to context and subject area for ease of listing.

Instructional Organization

Necessary Training for Research

1. Types of research and formulation of problem statement and hypotheses.
2. Experimental design and implementation.
3. Statistical analysis of experimental data and interpretation of results.
4. Testing and development.
5. Development-based research.

The Multiunit Organization and Individually Guided Education

1. Basic pattern of the multiunit school.

Educational Technology

Research in Educational Technology

1. Preliminary study
2. Basing the system on research

Research

Research Reports

1. Evaluating a research report.
2. Implementing the findings of a research report.

A total of 10 topics were identified as applying to this model program. The topic numbers are listed according to their classification in Volume II. It is not necessary that all the topics of a subject area be included as is illustrated by the fact that only one topic of the subject area, "Multiunit Organization and Individually Guided Education" was included.

The next step is to identify the individual specifications within each of the topics. This is done using a card sort in two steps: (1) sort on in-service and (2) sort on the topics that apply for the topics selected within subject area and context. The corresponding sort for this model program yields 49 specifications, broken down by identifying numbers in Table 14.

TABLE 14

SPECIFICATIONS IDENTIFIED BY NUMBER AND CATEGORIZED BY CONTEXT, SUBJECT AREA AND TOPIC: RESEARCH TRAINING PROGRAM

| Category | Specification Numbers | Number of Specifications |
|---|---|---|
| Instructional Organization | | |
| Necessary Training for Research | | |
| 1. Type of research and formulation of problem statement and hypotheses | 1001-1007 | 7 |
| 2. Experimental design and implementation | 1008-1019, 1035 | 13 |
| 3. Statistical analysis of experimental data and interpretation of results | 1020-1021 | 2 |
| 4. Testing and development | 1022-1030 | 9 |
| 5. Development-based research | 1031-1034, 1036-1037 | 6 |
| The Multiunit Organization & Individually Guided Education | | |
| 1. Basic Pattern of Multiunit Elementary School | 1216 | 1 |
| Educational Technology | | |
| Research in Educational Technology | | |
| 1. Preliminary study | 2101-2103 | 3 |
| 2. Basing the system on research | 2104-2105 | 2 |
| Research | | |
| Research Reports | | |
| 1. Evaluating a research report | 5040-5042 | 3 |
| 2. Implementing the findings of a research report | 5043-5045 | 3 |
| | Total | 49 |

Having identified the necessary specifications, we now come to the reordering or resequencing. The criterion used for reordering is the decision of the personnel who implement the model program. For the program under consideration, it is unlikely that it would be desirable to remove the in-service teacher from the teaching situation for an extended period of time and require full-time attendance at a university. However, it would likely be possible to develop a summer institute or have full-time attendance at a university summer school. A substantial portion of the program would involve off campus non-college-classroom type activities. Therefore, the reordering of specifications is according to a three category system: (1) campus-type activities and (2) non-campus type activities, and (3) combination type activities. The reordering of the 49 specifications by specification number is as follows:

| Campus | | | Non-Campus | | Combination | |
|---|---|---|---|---|---|---|
| 1001 | 1010 | 1021 | 1016 | 1036 | 1015 | 1216 |
| 1002 | 1011 | 1022 | 1024 | 1037 | 1023 | 2101 |
| 1003 | 1012 | 1025 | 1026 | 2104 | 1028 | 2102 |
| 1004 | 1013 | 5040 | 1027 | 2105 | 1031 | 2103 |
| 1005 | 1014 | 5041 | 1029 | | 1032 | |
| 1006 | 1017 | 5042 | 1030 | | | |
| 1007 | 1018 | 5043 | 1033 | | | |
| 1008 | 1019 | 5044 | 1034 | | | |
| 1009 | 1020 | 5045 | 1035 | | | |

The treatments suggested in the specifications provide the information for developing the operational components. The nine treatments provide the general heading for the operational components. A summary of the incidence of the different types of treatments is as follows:

| | |
|---|---|
| Cooperative Activity | 24 |
| Demonstration | 3 |
| Direct Experience | 5 |
| Discussion | 30 |
| Individual Study | 23 |
| Observation | 7 |
| Simulation | 6 |
| Skill Development | 3 |
| Telling (primarily lecture) | 26 |

The distribution of treatment incidence is at best a rough quantification, but it does provide information as to the nature of the program and the types of experiences necessary for the participants in order to meet the program objectives. The program under consideration requires considerable content study through lecture, discussion, and individual study. However, it also requires a good deal of cooperative activity and direct experience, related to conducting research in actual R & I Units. A breakdown of the treatment incidence relative to the system for reordering the specifications is presented in Table 15.

## TABLE 15

## INCIDENCE OF TREATMENT BY THE CATEGORIES FOR REORDERING SPECIFICATIONS

| Treatment | Category<br>Campus | Non-campus | Combination |
|---|---|---|---|
| Cooperative Activity | 11 | 7 | 6 |
| Demonstration | 0 | 2 | 1 |
| Direct Experience | 1 | 5 | 0 |
| Discussion | 19 | 5 | 6 |
| Individual Study | 16 | 5 | 5 |
| Observation | 4 | 3 | 0 |
| Simulation | 4 | 2 | 0 |
| Skill Development | 1 | 2 | 0 |
| Telling | 19 | 2 | 5 |

An inspection of the individual specifications reveals the detailed treatments (along with suggested materials and evaluation) that make up the operational components. One approach to implementing the program would be through an eight-week summer institute at the university followed by an in-service program during the following academic year. The in-service program would involve a minimum of one, three-hour session per week with periodic one-day conferences, conducted cooperatively by university and public school personnel. The summer institute would cover the majority of the necessary content. Incidence of individual study, discussion, and telling are greater during the campus activity. Cooperative activity is the most frequent of the non-campus treatments. If this approach were used for implementing the program, the reordering of the specifications would have included the insertion of a time sequence. The campus activity would occur first followed by non-campus and combination activities. The ordering of individual specifications within the three categories would be the option of the program implementer.

In this instance, the only entrance qualification to the program would be that of being a certified teacher anticipating teaching in a multiunit elementary school. However, entrance into the program would not of itself guarantee successful completion. Evaluation techniques would be employed.

The model presented illustrates the versatility of the specifications provided in Volume II. Specifications can be ordered and reordered according to any number of specific objectives, suggested treatments (including materials and evaluation procedures), plus a decision concerning a time sequence. A process is thus provided for the utilization of the product (specifications) from which teacher education programs for various target populations can be developed which can be limited to a few hours or extended into years of useful educational experiences. The process and product are never static but always flexible and innovative.

## Discussion of Composite Specifications

Any model programs that are developed from composite specifications as presented in this project require a clear definition of needs. The needs for the programs identified by the six major target populations discussed in this project were developed during the early part of the project through consideration of the five major contexts. Any specific model program developed out of these specifications begins with a statement of needs with related objectives, as indicated in the process discussed earlier. A basic assumption on which all model programs are based is that elementary schools in the very near future will undergo some marked changes and corresponding changes are necessary in the preparation of teachers for these schools. Along with this is the assumption that change in teacher education programs should be concurrent with, and supportive of, change and educational improvement in the elementary school. Each of the specifications has as its major basis one or more behavioral objectives comprising a part of the specification. Since the objectives are strictly behavioral in nature, the composite specifications has definite behavioral orientation. The theory and rationale that undergird this behavioral orientation are provided by the five contexts as the frame of reference in which the specifications were developed. Therefore, any model program developed from these specifications would have this underlying behavioral rationale. Treatment, methods, evaluations, and materials are provided in the individual specifications.

The experiences for the various target populations as reflected in the specifications require a better operational marriage between academic-cognitive type experiences and simulation, clinical, and operational experiences than has generally been true in the past. The participation of students in actual school experiences has been markedly increased over what is generally found in present programs. Much of this is related to the actual preparation for teaching in the multiunit school. This is true of all the target populations whether pre-service or in-service.

General education is not dealt with to any large extent in this project since the Request for Proposals (from the U.S.O.E.) did not call for the development of specifications in this area. This accounts for the fact that the initial specification requires only that the general education requirement will be met.

Rather than taking the generalist approach to the preparation of elementary teachers, the project emphasizes more in-depth study in the areas of mathematics, science, language arts, and social studies. Implicit in the specifications on "Necessary Training for Instruction" is the concept that elementary teachers will be required to have specialization in one of these four academic disciplines. This type of specialization is considered to be a portion of the general education requirements for all elementary teachers. Accordingly, the instruction in the areas of specialization will be a team approach involving college instructors representing the academic and professional disciplines.

The multiunit school organization also calls for specialists in such areas as art, music, and health and physical education. In order to get these persons to play an active role in the multiunit school, this model deliberately lessens the depth of training in these areas for the regular teacher.

The successful implementation of the specifications will require a critical assessment and some modification of existing general education programs for elementary teacher trainees, especially for those who are preparing to become pre-school--kindergarten teachers. This modification will be necessary since few complete formal programs now exist for preparing teachers to teach three and four year old children.

The matter of orientation of college and university personnel has been given a great deal of attention in the development of specifications. This group was singled out as one of the major target populations. The necessary training that these individuals will need is identified in the specifications for that population. The extent and duration of the orientation will depend upon individual needs in terms of past education and future role.

Various major points of emphasis relative to subpopulations of the teaching profession are contained in the specifications. The emphasis on orientation of university personnel has already been mentioned. Correspondingly, there is an emphasis on early childhood, that is, pre-school teachers were identified as a separate target population. Other groups also receive emphasis, not necessarily through identification as separate target populations, but by the very nature of the specifications. For example, the emphasis on preparing teachers for instructing disadvantaged youth is included within the context of societal factors and educational technology along with emphasis on individualized instruction.

The various programs developed are in themselves viewed as complete and adequate entities for the present. However, an important component of any program that is implemented, is the continual evaluation and feedback by which the program can be improved and kept up to date. This role of evaluation is discussed in considerable detail in the following chapter. Evaluation of this type is a relatively new concept in teacher education. This requires more detailed plans for the management evaluation and storage of information than are presently being utilized in teacher education programs.

Another basic assumption of the teacher education program is that the individual will participate in continuing education after he has entered the teaching profession. Continuing education should not be confused with in-service education. In-service education in the terminology of this project is designed to prepare teachers for multiunit organizations and the related components of these programs. Continuing education is viewed as education for professional growth, planned on an individual basis for the individual teacher. Continuing education is one of the mechanisms by which teachers as professionals can keep themselves abreast of the profession. A program of continuing education can be developed on the base of pre- and in-service education indicated by this project. Continuing education for those students who will be prepared according to the pre-service specifications will require a different kind of program than for those who will undergo retraining. At such time as these students complete the pre-service specifications, continuing education programs of a different nature will need to be developed. To this point very little reference has been made to programs culminating in degrees. We are not assuming that degrees will be awarded at the completion of the program except for the two pre-service populations. This is due to the fact that not all persons in the field would be eligible for admission to graduate programs. However, this does not preclude the awarding of degrees to those who are eligible to pursue graduate programs.

The degree consideration also introduces the subject of the length of time necessary to complete any model. Although we envision the possible completion of the two pre-service models within a four year span, we are unable to indicate definitely the exact time necessary for any program. We are convinced that it should not and cannot be the same for all individuals involved in a single program if individualized education is any aspect of that program. The program implementers can indicate a possible time sequence for any program ordered from the specifications. Time will be relative to the type and number of specifications involved and the individual capacities of the students undertaking a program. It is not anticipated that the suggested models in this chapter would exceed the time which has been available for teacher education activities.

Approaches to implementing the composite specifications of the model programs of this project require a much more integrated and combination effort on the part of universities, public schools, industry, state departments and the like. For example, the emphasis upon educational technology will require a considerable involvement of industrial and technological agencies. Emphasis upon the multiunit elementary school organization and the actual operational experiences of the students will require the involvement of the public schools to a much greater extent than is presently the case. With this involvement also comes the involvement of the state departments of education along with other education related agencies in the public schools. This would also include association with private agencies such as Educational Testing Service.

The facilities for colleges and universities, cooperating public schools, and other agencies engaged in implementation of the specifications, will require instructional centers designed for multiunit schools. Facilities will be required for the development and utilization of educational technology. For example, facilities will be needed for computer assisted instruction and special laboratories will be required for microteaching.

Most present elementary schools will require appropriate remodeling. Facilities will be needed for large group instruction, small group discussion, individual study and computer terminals. Additionally, both public schools and colleges and universities will be required to have extensive audio-visual and curriculum materials centers.

The specifications do not explicitly identify facilities or special personnel, but these are implicit in the treatments and materials. That is, in order to implement the specifications, special facilities and personnel are needed.

The teacher education student preparing for an elementary school position will have considerable contact with personnel from agencies such as industrial and technological concerns. Moreover, the training program itself is of such a nature that some of those involved in the education of elementary teachers would not themselves be elementary school specialists. For example, research training would involve people that most likely would not have had any elementary school experience. This would also be true of at least some of the personnel doing the training for programs involving educational technology.

Extended involvement of, and affiliation with, the public schools would provide a convenient avenue for the continued follow-up of the graduates of any program. The entire orientation of the specifications is of such a nature that continued participation and follow-up is an operational part of the program.

In conclusion the reader is reminded that when considering the composites of specifications of the model programs, it is necessary to view the composites for the particular program as an entity in themselves. The details of the program are dictated by the information in the specifications, through the treatments, materials and evaluations. The bases of all the specifications are one or more behavioral objectives indicated in the specifications. Methods by which the specifications can be taken in combinations, to develop composite specifications for model programs, provide a flexibility which enables the wide application of the 818 specifications developed in this project.

# Chapter V

# EVALUATION

## Introduction

Preceding sections of this report have revealed the details of an innovative approach to teacher education. We have evaluated the process at all stages of the effort and the product for internal consistency. This was important but not sufficient. What was required was a model which would serve for this activity and, more importantly, serve to guide and evaluate Phase III--the actual implementation of the program and evaluation of the effect of the new program. We believe that we have such a model. This section of the report is a detailed explanation of the derivation and proposed application of the model to this continuing effort to improve teacher education.

Education today is suffering because of a lack of systematic evaluation in teacher education. It is one thing to plan a course of training for teachers but it is quite another thing to forecast how future teachers will behave once they take full responsibility for their own classroom. The assumptions upon which we now base our program of training are well intentioned; our curriculum appears to be logically planned; we are not bound by our methods of teaching; and, yet, we cannot claim any assured general validity for our assumptions regarding curriculum and methodology. A systematic study of the published writings relating to teacher education shows that we have far too little unequivocal information upon which to base decisions. There is little, if any, evidence of a general nature that would indicate a relationship between the form of professional training a teacher has and the ultimate quality of his teaching. Indeed, there is a lack of agreement as to what consitutes good teaching although there is not dearth of expressed opinion.

This is not to say that we have neglected trying to secure definite knowledge but rather that we have assumed too simple a model for our thinking and evaluation of teacher training. Turner and Fattu say, "Seventy years of research in teacher effectiveness have not added much to our systematic knowledge and it is difficult to see how another seventy could do any more if the same procedures are followed."[21] Clearly, there is a need for an adequate system of evaluation to aid in decision-making with respect to innovations in teacher training.

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[21] R. L. Turner and Nicholas A. Fattu, "Skills in Teaching: A Reappraisal of the Concepts and Strategies in Teacher Effectiveness Research," Bulletin of the School of Education, Indiana University, 36, No. 3, May 1960.

## A Model for the Evaluation of Innovative Programs in Teacher Education

The remainder of this section presents a model for the evaluation of innovative programs in teacher education and suggests means for its implementation in the program being proposed in this document. The proposed evaluation model is an amalgamation of the Context, Input, Process, Product (CIPP) and Evaluative Programs for Innovative Curriculums (EPIC) evaluation models. The former model has been under development at The Ohio State University for the past three years, and the EPIC model was developed at the University of Arizona. While both models originally were geared largely to ad hoc evaluation studies for innovative projects, the present amalgamation attempts to provide for both continuous, systematic evaluation needs and unpredictable, ad hoc evaluation needs which emerge in programs of change. References pertaining to the CIPP and EPIC evaluation models are listed in a special bibliography at the back of this volume.

Basic Tenets of the Proposed Model. The general logic of the proposed model is shown in Figure 8. Program operations are evaluated to influence decisions which result in actions designed to improve program operations, which in-turn are evaluated, etc. Implicit in this logic are four tenets which form the basis for the evaluation model to be explicated in this section.

1. The purpose of evaluation is to provide information for decision-making; and to evaluate therefore, it is necessary to know the decisions to be served.

2. Since evaluation studies should answer questions posed by decision-makers, designs for such studies should satisfy criteria both of scientific adequacy and of practical utility. Specifically, evalution studies should meet criteria of validity, reliability, and objectivity, as should any scientific study. But, to be useful, they should also provide information which is viewed by the decision-makers since such studies sap valuable resources without yielding any usable benefits.

3. Since different types of decisions require different types of evaluation, a generalizable and efficient model of evaluation should be based upon a generalizable and parsimonious conceptualization of types of decisions and evaluation.

4. While the content of different evaluation designs varies, a single set of generalizable steps can be followed in the design of any sound evaluation study.

Given these tenets, we will define evaluation as the process of obtaining and providing information for decision-making. This definition is explicated and operationalized in the remainder of the section.

# THE RELATIONSHIP OF EVALUATION TO DECISION-MAKING

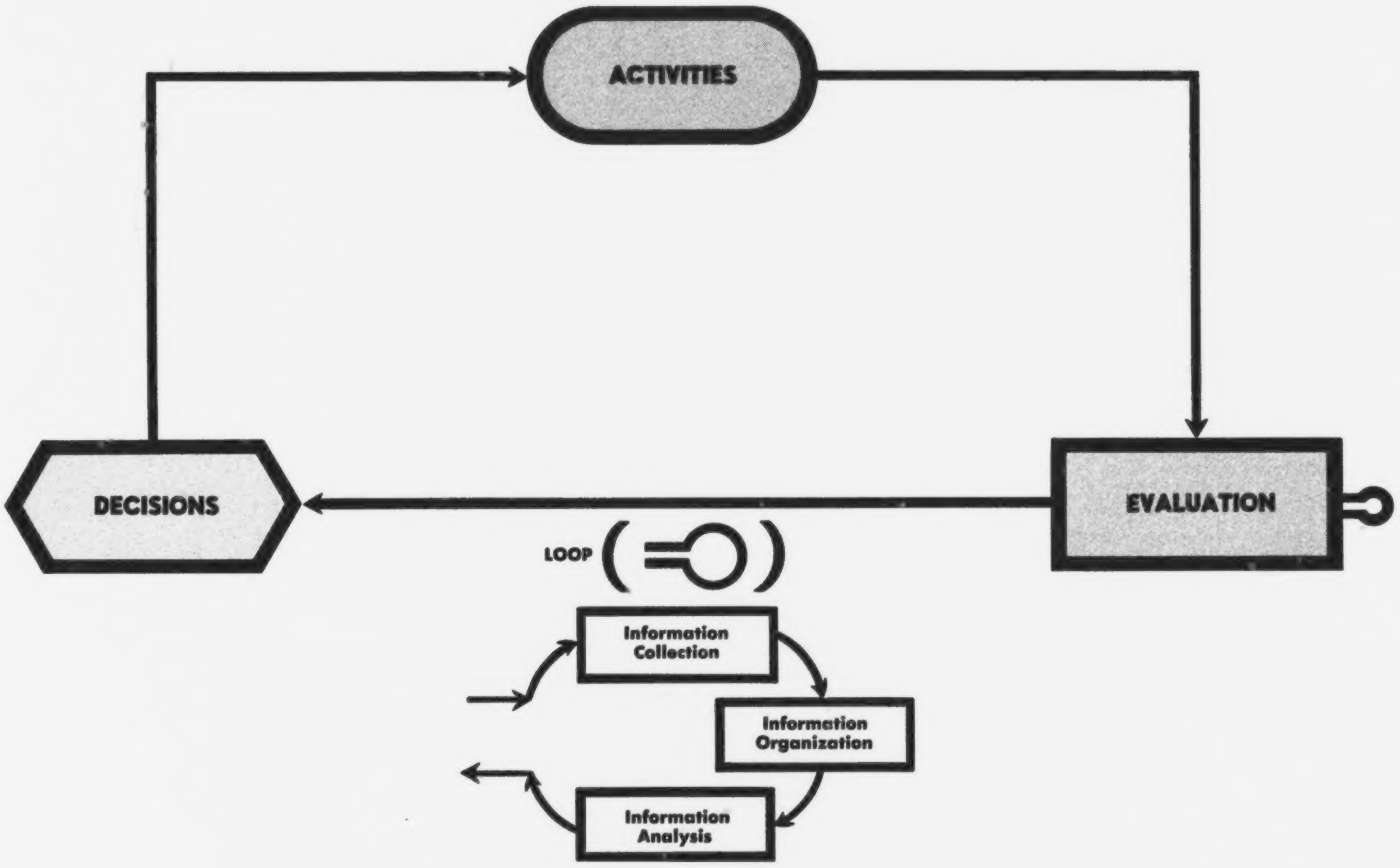
ACTIVITIES
DECISIONS
EVALUATION
LOOP
Information Collection
Information Organization
Information Analysis

Figure 8

Types of Evaluation. To use this definition, the specifications of educational evaluation systems require some knowledge of the educational decision situations to be served. Generally, four types of educational decisions seem necessary and sufficient for this purpose. These are: (1) planning, (2) structuring, (3) implementing, and (4) recycling decisions.

*Planning decisions* specify that changes are needed in a program. The need for such decisions arises from one of two sources: (1) awareness of a lack of agreement between what the program was intended to be and what it actually is (congruence evaluation), and (2) awareness of lack of agreement between what the program could become and what it is likely to become (contingency evaluation). In either case, a decision to change the intentions and/or the actualities in a program could be made.

*Structuring decisions* specify operationally defined objectives; general program strategies; and method, personnel, facilities, budget, schedule, organization, and context--for use in effecting desired changes. These decisions arise from three sources: (1) awareness of planning decisions which specify that the program is to be changed, (2) awareness that there are alternative means available to bring about the specified changes, and (3) awareness of the relative strengths and weaknesses of the available alternatives. Given these three conditions, an action plan to achieve the desired changes in a program can be structured.

*Implementing decisions* are those used in carrying through the action plan. These decisions arise from two sources: (1) knowledge of the procedural specifications, and (2) continuing knowledge of the relationship between procedural specifications and the actual procedures. These two kinds of information aid in process control.

*Recycling decisions* are those used in determining the relation of outcomes to objectives and in determining whether to continue, terminate, evolve, or drastically modify the activity. These decisions require information about: (1) specified outcomes, (2) actual outcomes, and (3) relation of the outcomes to the context within which the activity exists.

Given the four kinds of educational decisions considered above, there are also four kinds of evaluation. Context evaluation provides information for *planning decisions*. *Input evaluation* provides information for *structuring decisions*. *Process evaluation* provides information for *implementing decisions*, and *product evaluation* provides information for *recycling decisions*. In the context of the proposed teacher education program, *context evaluation* indicates the need for change within the program. *Input evaluation* helps determine how the change is to be effected, *process evaluation* aids in the day-to-day implementation of the change, and *product evaluation* identifies the outcomes of the change effort. Each of these kinds of evaluation are considered in detail as follows.

Context Evaluation. The major objective of context evaluation is to monitor continually the program of interest in order to identify needs for change as they occur. For example, the program of interest might be an innovative teacher education program of a university and the program of the inner-city schools in a large metropolitan area. A context evaluation of this program might reveal that the teachers' levels of understanding of the inner-city are far below what the school system expects for them. The identification of such a need for change would be followed by a careful analysis of all pertinent context data in order to write detailed problem specifications.

The method of context evaluation includes the definition and frequent measurement of variables which characterize the total program of interest. One set of such variables will be explicated later in this chapter. Another set of similar variables is employed in the Iowa Information Center at the State University of Iowa. Instruments for collecting context information include: interview schedules, questionnaires, and basic data forms.

Input Evaluation. To determine how to secure and utilize resources in order to accomplish desired changes, it is necessary to perform an input evaluation. The objective is to identify and assess relevant capabilities available to the program, to operationalize objectives, to identify and assess alternative action strategies for achieving the stated objectives, and to critique the operationalized strategy which is selected.

Essentially, input evaluation provides information for: (1) deciding whether outside assistance (e.g., money) should be sought, (2) delimiting the objective, (3) selecting the strategy to be employed (e.g., the adoption of available solutions or the development of new ones), and (4) specifying a procedural design for implementing the selected strategy.

Methods and instruments for input evaluation are lacking in education. The prevalent practices include panel deliberations, appeal to the professional literature, and the employment of consultants. There is much to recomment the continued use of these practices because their flexibility affords possibilities of accommodating highly idiosyncratic objectives. However, there is also a need for formal procedures and instruments to evaluate alternative instructional means. One promising program in this area is Project EPIE (Educational Products Information Exchange).[22] Its publications review and evaluate alternative instructional means.

Process Evaluation. Process evaluation is needed to provide periodic feedback to program personnel responsible for continuous control and refinement of the change effort, once implementation of an action plan has begun. The objective of process evaluation is to detect or predict, during the implementation stage, defects in the project operations and/or the project design.

The overall strategy is to identify and monitor, on a continuous basis, the potential sources of failure in a project. These include: interpersonal relationships among staff and students; communication channels; logistics; understanding of and agreement with the intent of the program by persons involved in and affected by it; adequacy of the resources, physical facilities, staff, and time schedule; etc. Process evaluation requires a resident observer who collects information such as that noted above. Techniques and instruments that are of use in this kind of evaluation include observation scales, interview schedules, questionnaires, rating scales, opinionnaires, suggestion boxes, etc.

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[22] The EPIE Forum, A Monthly Publication of the Educational Products Information Exchange Institute Created By and For Professionals in Education, New York: Educational Products Information Exchange Institute.

Product Evaluation. Product evaluation is used to determine the effectiveness of the change effort after it has run full cycle. Its objective is to relate outcomes to objectives and to context, input, and process (i.e., to measure and interpret outcomes).

The method is to: (1) operationally define and measure criteria associated with the objectives of the activity, (2) compare these measurements with predetermined absolute or relative standards, and (3) make interpretations of the outcomes using the recorded context, input, and process information. Many kinds of instruments, among them achievement tests, are useful in product evaluations. Michael and Metfessel[23] have recently provided a comprehensive list of instruments with potential relevance for data collection in product evaluation.

The Structure of Evaluation Design. Once an evaluator has selected an evaluation strategy, e.g., context, input, process, or product, he must next select or develop a design to implement his evaluation. This is a difficult task since few generalized evaluation designs exist which are adequate to meet emergent needs for evaluation. Thus, educators must typically develop evaluation designs *de novo*. What follows is an attempt to provide a *general* guide for developing evaluation designs. Specifically, an attempt is made to define in general terms and to explicate the general structure of designs for educational evaluation.

In general, design is the preparation of a set of decision situations for implementation toward the achievement of specified objectives. This definition says three things. First, one must identify the objectives to be achieved through implementation of the design. In a product evaluation, for example, such an objective might be to make a determination of whether all students in a remedial reading program attained specified levels of specific reading skills. Second, this definition says that one should identify and define the decision situations in the procedure for achieving the evaluation objective. Third, for each identified decision situation the evaluator needs to make a choice among the available alternatives. Thus, the completed evaluation design would contain a set of decisions as to how the evaluation is to be conducted and what instruments will be used.

It should be useful to evaluators in the proposed teacher education program to have available a list of the decision situations which are common to many evaluation designs. This would enable them to approach problems of evaluation design in a systematic manner. Also, such a list should be useful for defining the roles of the evaluation specialist in the proposed project.

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[23] Newton S. Metfessel and William B. Michael. "A Paradigm Involving Multiple Criterion Measures for the Evaluation of the Effectiveness of School Programs," *Educational and Psychological Measurement*, 27:931-36, 1967.

Table 16 is an attempt to provide such a general list of dicision situations for evaluation designs. By presenting this general list, it is asserted that the structure of evaluation design is the same for context, input, process, or product evaluation. This structure includes six major parts. They are:(1) focusing the evaluation, (2) information collection, (3) information organization, (4) information analysis, (5) information reporting, and (6) the administration of evaluation. Each of these parts will be considered separately.

Focusing the Evaluation. The first part of the structure of evaluation design is that of focusing the evaluation. The purpose of this part is to spell out the ends for the evaluation and to define policies within which the evaluation must be conducted. Specifically, this part of evaluation design includes four steps.

The first step is to identify the major levels of decision-making for which evaluation information must be provided. For example, in the Title III program of the Elementary and Secondary Education Act evaluation information from local schools is needed at local, state and national levels. It is important to take all relevant levels into account in the design of evaluations since different levels may have different information requirements and since the different agencies may need information at different times.

Having identified the major levels of decision-making to be served by evaluation, the next step is to identify and define the decision situations to be served at each level. Given our present low state of knowledge about decision-making in education, this is a very difficult taks. However, it is also a very important one and should be done as well as is practicable. First, decision situations should be identified in terms of those responsible for making the decisions, e.g., teacher, principals, the board of education members, state legislators, etc. Next, major types of decision situations should be identified, e.g., appropriational, allocational, approval, or continuation. Then, these types of decision situations should be classified by focus, e.g., research, development, diffusion or adoption. (This step is especially helpful toward identifying relevant evaluative criteria.) Next, the timing of the decision situation to be served should be estimated so that the evaluation can be geared to provide relevant data prior to the time when decisions must be made. And, finally, an attempt should be made to explicate each important decision situation in terms of the alternatives which may resonably be considered in reaching the decision.

Once the decision situations to be served have been explicated, the next step is to define relevant information requirements. Specifically, one should define criteria for each decision situation by specifying variables for measurement and standards for use in the judgment of alternatives.

The final step in focusing the evaluation is to define policies within which the evaluation must operate. For example, one should determine whether a "self-evaluation" or "outside evaluation" is needed. Also, it is

## Table 16

## PROCEDURES FOR DEVELOPING EVALUATION DESIGNS

Major components for Context, Input, Process or Product Evaluation

### Focusing the Evaluation

1. Identify the major level( ) of decision-making to be served, e.g., local, state and national.
2. For each level of decision-making, project the decision situations to be served and describe each one in terms of its locus, focus, timing, and composition of alternatives.
3. Define criteria for each decision situation by specifying variables for measurement and standards for use in the judgment of alternatives.
4. Define policies within which the evaluation must operate.

### Collection of Information

1. Specify the source of the information to be collected.
2. Specify the instruments and methods for collecting information.
3. Specify the sampling procedure to be employed.
4. Specify the conditions and schedule for information collection.

### Organization of Information

1. Specify a format for the information which is to be collected.
2. Specify a means for coding, organizing, storing, and retrieving information.

### Analysis of Information

1. Specify the analytical procedures to be employed.
2. Specify a means for performing the analysis.

### Reporting of Information

1. Define the audiences for the evaluation reports.
2. Specify means for providing information to the audiences.
3. Specify the format for evaluation reports and/or reporting sessions.
4. Schedule the reporting of information.

### Administration of the Evaluation

1. Summarize the evaluation schedule.
2. Define staff and resource requirements and plans for meeting these requirements.
3. Specify means for meeting policy requirements for conduct of the evaluation.
4. Evaluate the potential of the evaluation design for providing information which is valid, reliable, credible, and timely.
5. Specify and schedule means for periodic updating of the design.
6. Provide a budget for the total evaluation program.

necessary to determine who will receive evaluation reports and who will have access to them. Finally, it is necessary to define the limits of access to data for the evaluation team.

Collection of Information. The second major part of the structure of evaluation design is that of planning the collection of information. This section must obviously be keyed very closely to the criteria which were identified in the evaluation focus part of the design.

Using those criteria one should first identify the sources of the information to be collected. These information sources should be defined in two respects; first, the origins for the information, e.g., students, teachers, principals or parents; and second, the present state of the information, i.e., in recorded or non-recorded form.

Next, one should specify instruments and methods for collecting the needed information. Examples include achievement tests, interview schedules and searchers through the professional literature. Michael and Metfessel[24] have recently provided a comprehensive list of instruments with potential relevance for data collection in evaluations.

For each instrument that is to be administered, one should next specify the sampling procedure to be employed. Where possible, one should avoid administering too many instruments to the same person. Thus, sampling without replacement across instruments can be a useful technique. Also, where total test scores are not needed for each student, one might profitably use multiple matrix sampling where no student attempts more than a sample of the items in a test.

Finally, one should develop a master schedule for the collection of information. This schedule should detail the interrelations between samples, instruments, and dates for the collection of information.

Organization of Information. A frequent disclaimer in evaluation reports is that resources were inadequate to allow for processing all of the pertinent data. If this problem is not to arise, one should make definite plans regarding the third part of evaluation design: organization of information. Organizing the information that is to be collected includes providing a format for classifying information and designating means for coding, organizing, storing, and retrieving the information.

Analysis of Information. The fourth major part of evaluation design is analysis of information. The purpose of this part is to provide for the descriptive or statistical analyses of the information which is to be reported to decision-makers. This part also includes interpretation and recommendations. As with the organization of information, it is important that the evaluation design specify means for performing the analyses. This role should be assigned specifically to a qualified member of the evaluation team or to an agency which specializes in doing data analyses. Also, it is important that those who will be responsible for the analysis of information participate in designing the analysis procedures.

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[24] Ibid.

Reporting of Information. The fifth part of evaluation design is the reporting of information. The purpose of this part of design is to insure that decision-makers will have timely access to the information they need and that they will receive it in a manner and form which facilitates their use of the information. In accordance with the policy for the evaluation, audiences for evaluation reports should be identified and defined. Then, menas should be defined for providing information to each audience. Subsequently, the format for evaluation reports and reporting sessions should be specified. And, finally, a master schedule of evaluation reporting should be provided. This schedule should define the inter-relations between audiences, reports, and dates for reporting information.

Administration of Evaluation. The last part of evaluation design is that of administration of the evaluation. The purpose of this part is to provide an overall plan for executing the evaluation design. The first step is to define the overall evaluation schedule. For this purpose it often would be useful to employ a scheduling technique such as Program Evaluation and Review Technique. The second step is to define staff requirements and plans for meeting these requirements. The third step is to specify means for meeting policy requirements for conduct of the evaluation. The fourth step is to evaluate the potential of the evaluation design for providing information which is scientifically adequate and practically useful. The fifth step is to specify and schedule means for periodic updating of the evaluation design. And, the sixth and final step is to provide a budget for the evaluation.

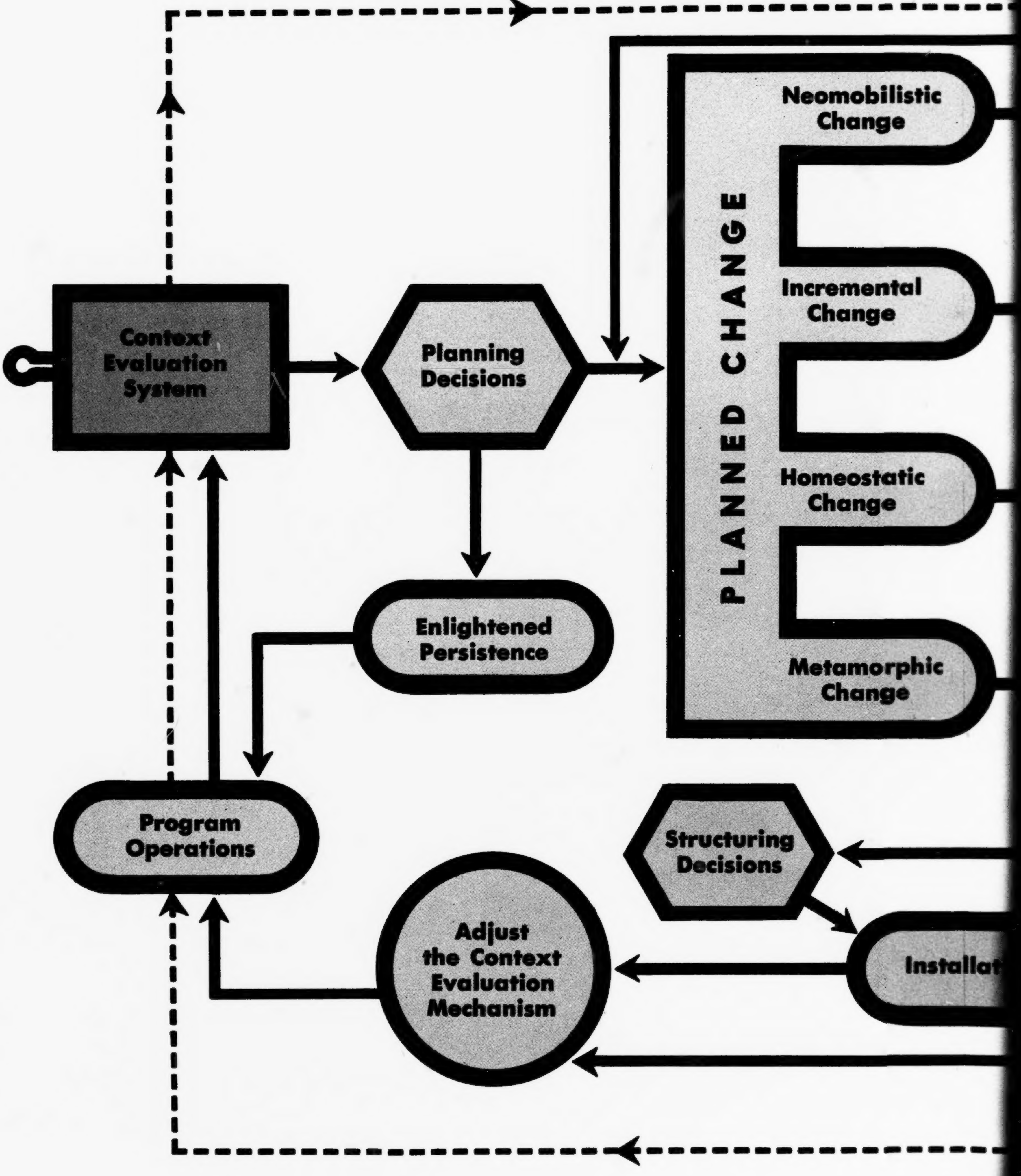
A Conceptual Schema of the Total Proposed Evaluation System. Reliance upon ad hoc evaluation studies can prove to be an inefficient and ineffective means of providing information for decision-making within the system. Rather, educational systems should have well functioning evaluation programs which provide a dynamic baseline of information about the system. Such an evaluation program would need the regular, evaluative information requirements of the system, and should be responsive to emergent needs for idiosyncratic data. Figure 9 is presented as an overview of the total evaluative program being proposed herein which provides for systematic context evaluation and ad hoc process and product evaluations. The outer loop represents a continuous, systematic context evaluation mechanism. This mechanism provides information to the planning body of a system for use in making decisions to change the system or to continue in the present procedures in the knowledge that they are serving important objectives effectively and efficiently. If the context evaluation indicates that there are no descrepencies between the intentions and actualities or between possibilities and probabilities the planning body likely would make choices which would result in a "steady-as-you-go" or "enlightened persistence" state.

However, if the context evaluation indicated that the program is deficient in some way, a rational decision-making body likely would decide to bring about changes to remove the deficiencies. Such changes as indicated in Figure 9 can be of four types.

1. Metamorphic change would be based upon decisions to effect large changes in the program supported by a high level of relevant understanding concerning how to bring about such changes.

2. Homeostatic change would be based upon decisions to effect small changes supported again by a high level of relevant understanding.

# THE CIPP EVALU


Context Evaluation System
Planning Decisions
Neomobilistic Change
Incremental Change
PLANNED CHANGE
Homeostatic Change
Metamorphic Change
Enlightened Persistence
Program Operations
Structuring Decisions
Adjust the Context Evaluation Mechanism
Installat

Fig

# LUATION MODEL

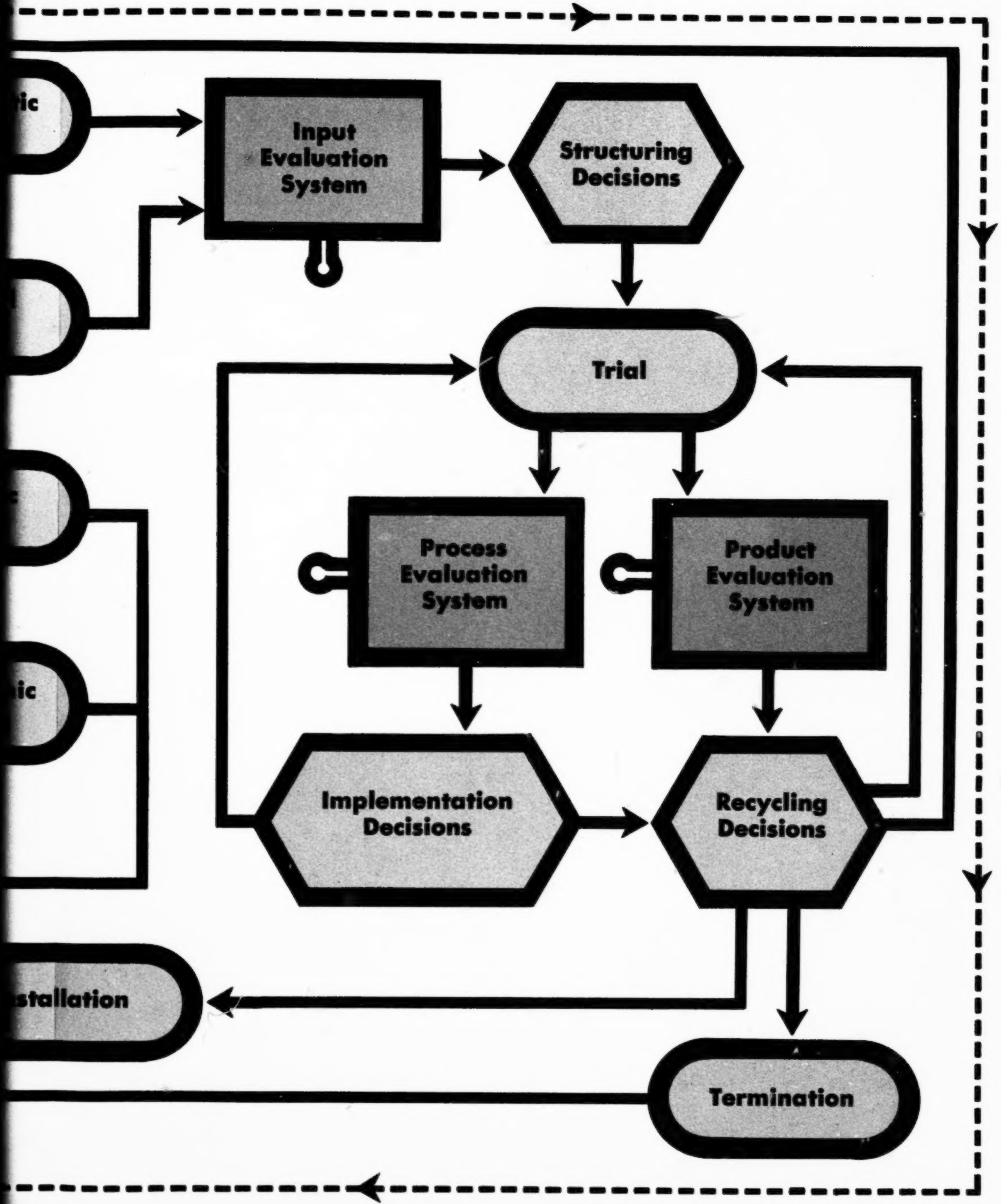

ic
Input Evaluation System
Structuring Decisions
Trial
Process Evaluation System
Product Evaluation System
ic
Implementation Decisions
Recycling Decisions
stallation
Termination

Figure 9

3. Incremental change would be based upon decisions to effect a small change supported by a low level of relevant understanding, and

4. Neomobilistic change would be based upon decisions to effect large change supported by a low level of relevant understanding.

Depending upon the types of change which results from planning decisions, vastly different evaluation measures might be called for. In response to homeostatic or metamorphic change where adequate information to support decision-making is already available from the research literature and/or the context evaluation mechanism, it would be unwise to mount an expensive evaluation study to provide information which is redundant to that which already is available to the decision-maker. Therefore, our model shows (1) that decision-makers would make structuring decisions regarding the means necessary to bring about homeostatic or metamorphic change without any intervening evaluation support mechanism, and (2) that these structuring decisions would lead directly to installation of change in the program and subsequent adjustment of the context evaluation mechanism so that the new feature in the system would routinely be monitored by the systematic context evaluation.

If on the other hand, neomobilistic or incremental change are called for there is a definite need for ad hoc evaluation mechanisms to support such change; for both the context evaluation mechanism and the research literature provide inadequate supplies of information to support these types of changes.

First, an input evaluation study must be done to identify and evaluate strategies and procedures which could be used to effect desired changes. Such input evaluation information should assist decision-makers to make decisions in designing desired change procedures. In turn, the structuring decisions usually lead to some kind of a trial or pilot phase. For, as yet, the desired change is an innovation, has not been adequately tested, and, therefore, likely is not ready for installation in the total system.

Process and product evaluation are next included to aid in decisions pertaining to the trial phase. Process evaluation would provide information for implementation decisions needed for efficient operation of the trial. Product evaluation would go on simultaneously throughout the process of the trial in conjunction with process evaluation and would support recycling decisions which could lead to a reformulation of the change to be brought about, a modification either in strategy or procedure, a termination of the change effort, or the installation of the total program. In the case of installation, again, the context evaluation mechanism would be adjusted so as to allow systematic monitoring of the new element in the total system.

It should be noted that the context evaluation system is continuous and systematic while the input, process and product evaluation mechanisms are ad hoc and come into being only when it is desired to bring about changes within the system for which adequate supporting information is not already available. One final point should be observed regarding this overview of our evaluation system. The small loops attached to each of the evaluation systems on the chart represent the elements of evaluation design described in the previous section: focusing, information collection, information organization, information analysis, information reporting and evaluation administration.

In the following section these evaluation functions will be explicated for the proposed context evaluation mechanism since it is a systematic part of the evaluation program being proposed.

Context Evaluation

Context evaluation, applied to teacher education, is defined as that sytem which is designed to monitor the total program. The major objective of context evaluation is to define the environment where change is to occur, the environment's unmet needs, and the problems underlying those needs. Context evaluation, as described here, is composed of four major sub-sytems: program explication, data collection, information processing and storage, and planning. The four sub-systems and their relation to the change process are illustrated in Figure 10.

Program Explication. Program explication is composed of six steps. These six steps are: (1) program definition, (2) description of program structure, (3) description of subjects (people), (4) description of terminal behavioral, (5) identification of objectives, and (6) operational definition of the objectives developed.

Program Definition. Program definition is that specific set of statements that describes each of the components of the teacher education program (e.g., selection criteria, content mastery, general education, professional education, etc.). Such statements are not easily developed, and often require a good deal of time and effort on the part of the program staff before consensus is reached. Adequate program definition provides a clear and concise statement as to what it is that is to be investigated.

Description of Program Structure. Once each of the components within the total program has been defined, the second step is that of adequately describing the program through some logical structure of variables that will allow a complete description of each of the components within the total program. The task of isolating those variables that affect the teacher training program becomes most complex as one begins to confront the mass of literature relating to theory and research on instruction that has accumulated over the past years. As one is able to review small portions of the literature, variables begin to emerge that can be identified as having definite implications for the evaluation of such programs. Four of these variables (organization, task, method, and facilities) are mentioned in one form or another in almost every published document on research and theory of instruction. The fifth variable (cost) has been more recently introduced due to Federal legislation and the rising cost of education. For the purpose of the document each of these variables will be defined.

Organization - Organization, as defined here, is the matrix in which subjects (people) are brought together to perform given tasks. The organizational matrix is divided into three components--time, horizontal organization, and vertical organization. Time represent the duration and sequence of blocks of time devoted to the program. Sequence is the order in which subjects are taught. Duration and sequence may be thought of in terms of both daily and weekly scheduling. Vertical organization serves to classify students and move them upward from the point of admission to the point of departure. Horizontal organization provides for the many alternatives for patterns of instruction. But, all of these patterns are derived from essentially four different kinds of considerations--consideration of the student, the curriculum, the instructors' qualifications, and the school's

# HAMMOND-STUFFLEBEAM EVALU

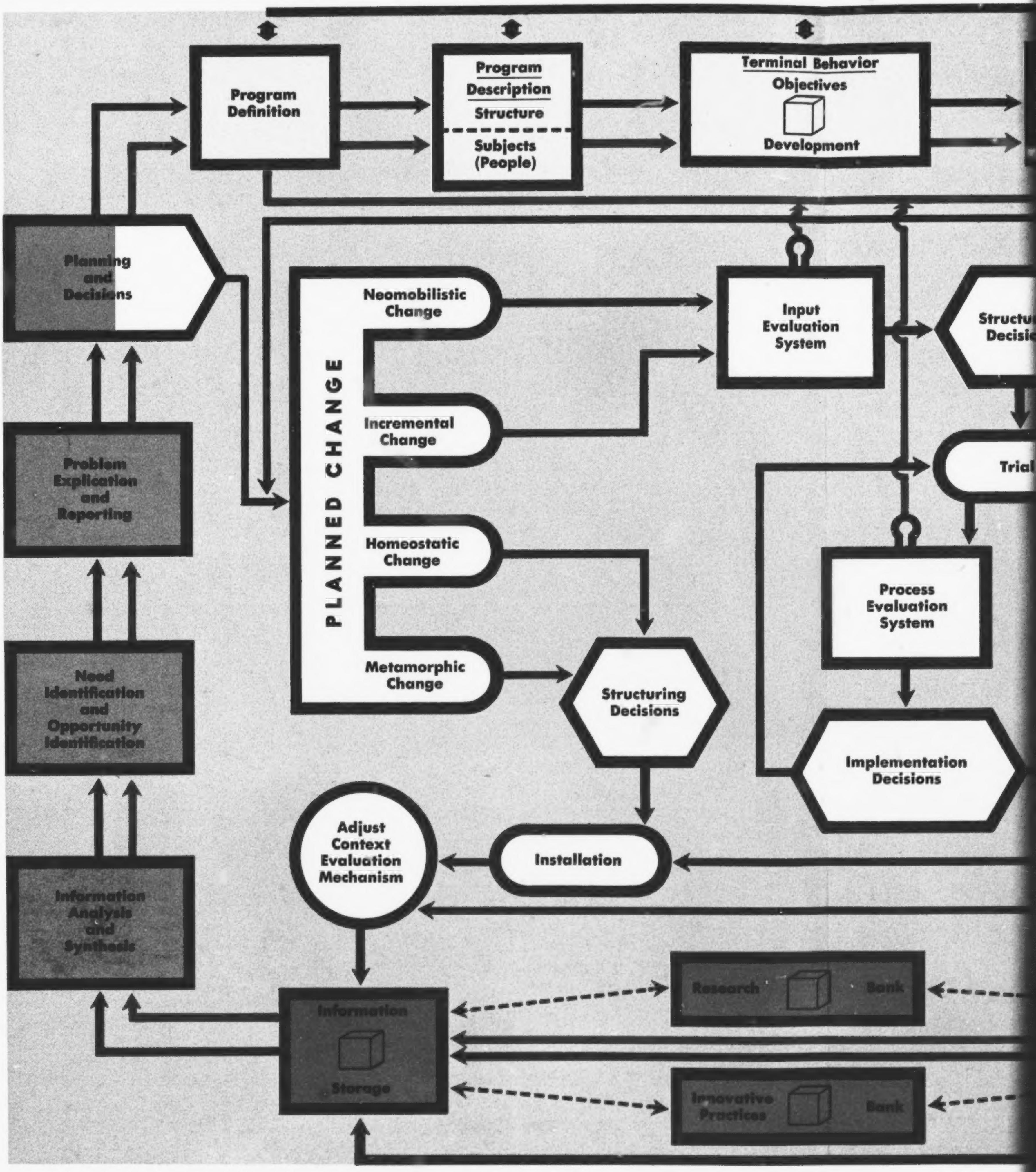
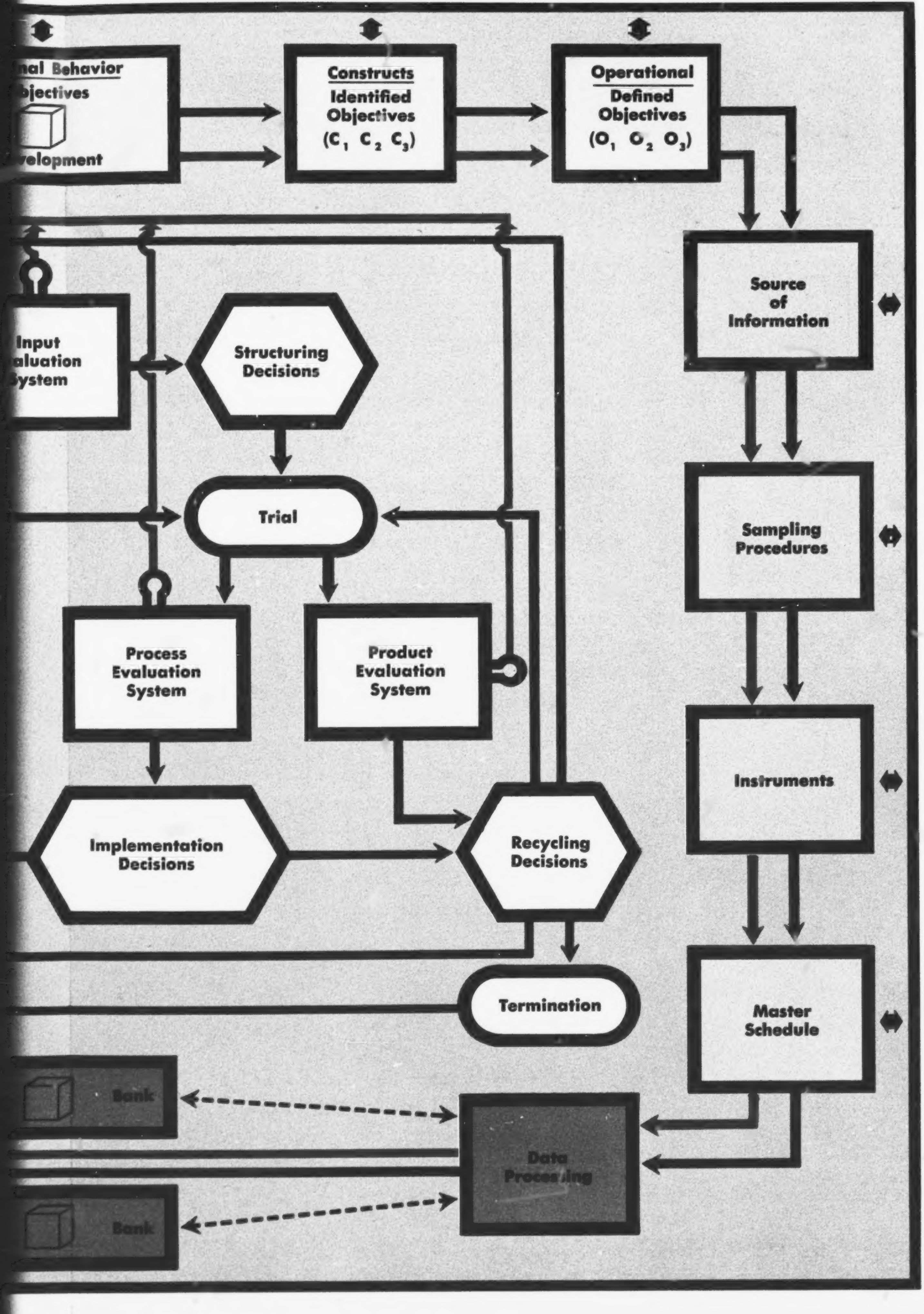

Program Definition
Program Description
Structure
Subjects (People)
Terminal Behavior
Objectives
Development
Planning and Decisions
PLANNED CHANGE
Neomobilistic Change
Incremental Change
Homeostatic Change
Metamorphic Change
Input Evaluation System
Structu
Decisio
Trial
Process Evaluation System
Implementation Decisions
Structuring Decisions
Problem Explication and Reporting
Need Identification and Opportunity Identification
Information Analysis and Synthesis
Adjust Context Evaluation Mechanism
Installation
Information Storage
Research Bank
Innovative Practices Bank

Figure 10

# AM EVALUATION MODEL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System
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Evaluation
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Instruments
Implementation
Decisions
Recycling
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Termination
Master
Schedule
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Data
Processing
Bank

gure 10

philosophy. Some of these patterns are associated with efforts to eliminate the administrative and instructional characteristics of rigid, lockstep organizational structure. One of the steps in this direction is through cooperative teaching (e.g., team teaching).

Task - Task, as defined here, is the set or subset of activities performed by the subjects within a given program. The set of activities is divided into two components -- content and process. Content is that structure or body of knowledge which is identified with the subject matter of a discipline and given substantive meaning to process. Process, as defined here, is that series of interrelated activities and events leading to the accomplishment of a given task. Subject matter of a discipline has some ideal or logical order or sequence in its presentation. Students, instructors, etc., all have certain activities or roles to be performed in any instructional program.. The nature of these activities will be dependent upon the philosophy and goals established by the institution.

Methodology - Methodology is that formal structure of the sequence of activities designed to faciliate learning. The term covers both teaching activities and theories of learning. Teaching activities are those patterns of teaching designed to structure pupil and teacher interaction within the learning environment. Patterns of teaching are those activities performed in the classroom which imply patterns of teacher behavior as well as modification in objectives and content (e.g., lecture, discussion, committee, drill, individual supervised study, etc.). Interaction, as defined here, is those relationships produced by patterns of behavior within the learning environment, e.g., teacher--student, student--student, media--student, teacher--teacher, media--teacher. Learning theory is that set of learning principles utilized in structuring the sequence of activities designed to facilitate learning, e.g., behavior which represents the achievement or partial achievement of an educational objective should be reinforced.

Facilities - Facilities, as defined here, are space, special equipment, and expendables needed to support an educational program.

Cost - Cost is defined as the money required for facilities, maintenance, and personnel within a given program.

Description of Subjects (People). Any analysis of forces affecting a given program demands a description of those subjects (people) who relate to the program under analysis. Evaluation programs of the past have primarily focused on the student as the force affecting the instuctional program. Once a program for teacher training has been designed to meet the needs of students, other subjects within the educational environment may well act as a positive or negative force on the program.. The instructors' training, background, and attitude toward the new program will have definite effects on the successful implementation. The administration's philosophy and point of view directly affect that which is to be implemented. Departments within the system involving specialists in educational psychology, philosophy, etc., play a vital role in successful implementation. All departments and specialists, in one way or another, affect the instructor and students of any given course or segment of a program to be evaluated.

The needs of the community expressed through local school districts play a vital role in the success of teacher training programs. Systems for bringing schools, within the communities they serve, closer to the training institution must be developed if their needs for trained personnel are to be met. For the purpose of program description, a system for catagorizing data important to the variable of student, instructor, administrator, specialist (scholars in education), and the community (school districts, etc.) must be developed.

Description of Terminal Behavior. A third set of variables necessary to program explication are those of terminal behavior. Any model program for teacher training must be based on some sytem of behavior or changes in behavior on the part of students, instructors, etc. This behavior is usually expressed in terms of goals, objectives, etc. Do we expect our future teachers to be walking encyclopedias, or do we expect them to be able to apply the knowledge they have gained in a variety of ways which often requires some degree of creativity?

Careful consideration must be given to a system for describing behavior. The Taxonomy of Educational Objectives developed by Bloom and other (1956)[25] suggests one scheme for describing this behavior. Before objectives are developed, it is important that decisions be made as to whether only cognitive behavior should be taken into consideration as well. Those behaviors to be analyzed must be stated clearly, with adequate definitions, so that they may be utilized in the development of educational objectives.

Identification of Objectives. With the program described, through the above sets of variables, the fifth step in program explication is that of clarifying the objectives for the program. Theoretically, objectives should determine the total structure of the program. For purposes of context evaluation, the order in which objectives are developed will not be debated other than to say that they must be developed through some well organized system requiring the interaction of the three sets of variables described.

Operational Definition of Objectives. Once the program objectives have been clarified, the final step in program description is that of defining the objectives in operational terms. The process of operationally defining objectives may be demonstrated by an example used from the original proposal to develop a teacher education program.[26]

1. Identification of Objective
   "To have all prospective teachers be able to write test items at the six levels of Bloom's Taxonomy, Cognitive Domain."

2. Objective (operationally defined)
   "To have all prospective teachers be able to write test items at the six levels of Bloom's Taxonomy, Cognitive Domain."

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[25] Benjamin S. Bloom, Taxonomy of Educational Objectives, Handbook I: Cognitive Domain, New York: Longman, Green and Company, 1956.

[26] Adapted from A Proposal to Develop Educational Specifications for a Comprehensive Teacher Education Program, Submitted by a Consortium of The State Universities of Ohio, University of Toledo Research Foundation, Toledo, Ohio.

3. Materials and Time Necessary

   a. Copy of Taxonomy of Educational Objectives: The Classification of Educational Goals, Handbook I: Cognitive Domain, Benjamin S. Bloom.
   b. Copy of Preparing Instructional Objectives, Robert F. Mager.
   c. Subject matter content about which test items will be constructed.
   d. Time to construct the test.
   e. Jury of colleagues to verify the extent to which the test items reflect the six levels of the Cognitive Domain.
   f. Paper and pencil.
   g. Released instructional time for testing.
   h. Room in which to administer test.

4. Treatment

   a. Demonstration lecture and practicum employing Bloom's Taxonomy of Educational Objectives in the College program. (Also employ instructional strategies as denoted by W. James Popham, Robert Gagne and Robert Mager.)

5. Evaluation

   a. Did the test evidence the requisite student behavior?

With the above objective operationally defined, there is little doubt in the evaluator's mind as to what has to be done to measure such an [illegible] objective. The evaluator is required at this point to provide or develop an instrument for the student behavior described in the objective.

In the case of this project it is important to recall that the several educational specifications not only were operationally defined in the behavioral objective, but also made explicit provision for the evaluation of each specification.

Effective evaluation practices require a complete picture of the program to be analyzed. If the evaluator is provided with vague statements and inadequate descriptions, it is impossible to present a clear picture of what has been and/or is taking place within a given program.

Collection of Data. The second sequence of steps in the context evaluation system is that of a planned system for the collection of data. This sub-system should be keyed closely to the sub-system of variables identified in program explication. The collection of data system will be identified through four steps in the collection of data: (1) sources of information, (2) sampling procedures, (3) instrument development, and (4) the master schedule for the collection of information.

Source of Information. For each item of information to be collected the source from which that information is to be collected must be identified. Information sources should be defined in terms of the orgin and the present state of the information. Along with these considerations certain criteria of selection should be taken into consideration. Evaluative products have certain features in common with any good information, such as research information. These common features of good information include:

Internal validity - One way to express the criterion of internal validity is to say that the information must have fidelity -- there must be a good, if not a one-to-one correspondence between the information and the phenomena it represents.

External validity - This criterion refers to the meaning of the data when applied to situations other than the one that gave rise to them. Do they apply only to the subjects from whom they were gathered, or may they be taken as representing what one might find if the evaluation were repeated elsewhere?

Reliability - This criterion refers to the internal consistency of the evaluative information.

Objectivity - This criterion refers to the publicness of the evaluative data. Is the evaluation based upon private testimony, such as opinions, which, while perhaps replicable and therefore reliable, might not be agreed to by an independent observer?

Evaluative information must have certain characteristics that are not typically required of research information, but which have special meaning to the decision-maker. Six criteria are applicable here.[27]

Relevance - To be useful to the decision-maker, information must be relevant (i.e., it must relate to the decisions which the decision-maker is about to make).

Significance- The methods of analyzing and reporting information to the decision-maker so as to call out materials of less interest and to point out those implications of greatest utility that are of great concern deciding whether an evaluation will have value.

Scope - Information may be relevant and significant, but may not have sufficient scope to guide the decision-maker. The information must relate to all of the aspects involved in the decision.

Credibility - Credibility has to do with the quality of trust. The decision-maker is often faced with the necessity of making decisions concerning unfamiliar items. Indeed, that is the purpose of the evaluation activity--to inform. . The responsibility for the decision rests not with the evaluator, but with the decision-maker. If an erroneous decision is made, the decision-maker is guilty. Hence, the evaluator who furnishes the information must be trusted, since the decision-maker cannot attest to the validity of the information. If the information comes from a source which the decision-maker does not find credible, the information will not be used, rather than expose the decision-maker to the sanctions that might be imposed if the wrong decision is made. Again, the evaluator's role is a very sensitive one in the area of human relations.

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[27] Robert L. Hammond, Daniel L. Stufflebeam, and Egon G. Guba, Planning and Implementing Title III Evaluations, a Statement Prepared Under Contract With the Division of State Agency Cooperation, U. S. Office of Education, April 22, 1968, p. 5.

Timeliness - The best information cannot influence a decision already made. Unless the information gets to the decision-maker while still in the process of making the decision, it is useless.

Pervasiveness - This criterion has to do with the nature of the audiences that should recive the evaluative information. Decision-makers are rarely single individuals, and many decisions must be concurred in by groups of persons.

Sampling Procedures. Once the source of information has been identified and assessed with respect to the above criteria, the next step whould be one of examining the possible sampling procedures that might be employed in the evaluation. For each instrument that is to be developed and administered certain sampling procedures may be employed. Whenever possible, the administering of too many instruments to the same person should be avoided. Thus, sampling without replacement across instruments can be a useful technique. Also, where total test scores are not necessary for each student, multiple matrix sampling in which no student attempts more than a sample of the itmes in a test might profitably be used.

Instrument Development. With the source of information identified and the possible sampling procedures that might be employed, the next step is that of selecting or developing instruments necessary to gather data. Instruments and methods for collecting the information need to be specified. Examples include achievement tests, interview schedules, and searches through the professional literature. Specific objectives require special instruments for measuring behavior. These instruments are provided for through a review of the literature (e.g., O. Buros, Sixth Mental Measurements Yearbook), or constructed tests designed to fulfill the needs for behavior analysis. Methods of collecting information may require the development of special forms (e.g., background information on students, instructors, community, etc.). Properly constructed instruments for collecting information should be carefully drafted, taking into consideration both usability and relationship to the coding system to be utilized for storage and retrieval purposes.

Master Schedule for Collection of Information. With each of the above steps defined, a master schedule for the collection of information should be developed. This schedule should detail the inter-relations between samples, instruments, and dates for the collection of information. No attempt will be made here to outline all the necessary components of such a schedule other than to emphasize its importance to long-range plans for evaluation.

Information Processing and Storage System. The third link in the context evaluation system is that of an information processing and storage sub-system. The monitoring of the teacher education program through context evaluation should include a system that provides for: (1) the processing of data, (2) a research bank, (3) an innovative practices bank, and (4) a central information storage system. A system based on these components was prepared for the EPIC Evaluation Center in Tucson, Arizona by Ross O. Armstrong.[28] The basic components of this system will be discussed and adapted to the sub-system proposed for the context evaluation system for teacher education.

Data Processing. The data processing facility will possess the potential required for the following:

1. Provide machine scoring services for standardized testing and non-standardized instruments to the various departments within the teacher training program.
2. Prepare listing and reports of scores for use by the departments.
3. Compile descriptive statistics useful in test interpretation.
4. Develop test norms for the tests used.
5. Maintain student records for all participants in the program.
6. Analyze tests through item analysis procedures to determine curriculum, student, or test deficiencies.
7. Provide computational and numerical analyses services to researchers.
8. Develop and operate a data bank from which selected information could easily be retrieved from storage.
9. Provide access and distribution services for data bank information to departments, faculty, etc. This would include not only raw data listing but any necessary empirical analysis or summarizations considered necessary to render the data useful.
10. Provide data processing and computer service to authorized researchers.
11. Engage in research to develop instructional applications of the central processing unit. This would include working with specialists to develop not only computer assisted instructional materials, but also to develop testing materials for use through the remote access capability potential of the data system.
12. Assist in the design and standardization of accounting forms and reports.
13. Process and summarize school census information for the region.
14. Provide a data communications network for inter-change between the various cooperating colleges and universities.

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[28] Adapted from a proposed Information Storage and Processing System for EPIC by Ross O. Armstrong, University of Minnesota, Minneapolis, Minnesota.

15. Serve as an intra-program communications network for context, input, process, and product evaluation systems.

Research Bank. There are at least eight characteristics of a useful research data bank:

1. It possesses data which represent a well-known target population. The importance of randomness in samples cannot be emphasized enough. Too often samples are quick and easy "pick-ups" and the statistics derived from them are meaningless. This bank will provide information to design and implement instruments and regular collection procedures to accumulate basic pertinent data concerning all participants in the teacher training program. A similar effort should be undertaken for communities (school districts) involved in the projects of the teacher training institution.

2. It contains a wide range of specific obeservations and variables. This breadth is essential so that the bank is applicable to a variety of research questions.

3. Data are easily accessible through modern methods of information retrieval in a reasonable amount of time. Remote inquiry facilities make this feature even more attractive and convenient.

4. The data bank helps solve for the researcher, who has limited resources, the dilemma of whether to collect many data on a small sample, or limited data on a large sample. The pooling of resources through the cooperative efforts implied in data banking permits large samples of behavior and subjects.

5. The uniformity of collection time and conditions gives comparable data which are so essential if generalizations are to be extensive.

6. Data banking gives great promise for expanded and improved longitudinal studies. Not only does it make record linkage easier, but by virtue of its deposit procedures, it guarantees permanence inspite of lack of continuity of personnel, program, or facility. In fact, it will encourage studies that would not otherwise be undertaken because of the impossibility of collecting data.

7. A data bank is able not only to merge, collate, and link data from different periods of time, but can accomplish this for subjects and data on institutions and experiences to which those subjects have been exposed; e.g., schools, colleges, employment, hospitals, etc.

8. Extremely important is the minimizing of duplication of effort by research and subject. A carefully conceived data collection procedure will minimize the number of contacts made with subjects and reduce the burden on schools and students for supplying information to researchers. The bank will not only encourage cooperation of schools and subjects with the research but will assure cleaner information, free from the harassment factor due to repetition of requests from different researchers within a short period of time.

Exemplary and Innovative Practices Bank. In addition to the above, the system should maintain an updated file on exemplary and innovative practices in teacher education as well as education in the public schools. It should be able to supply updated lists and descriptions of programs, personnel, materials, costs, and status reports. An extensive data repository of this type can provide all or only selected information on demand in a resonable time. The data repository can assume the burden of supplying information to authorized persons or agencies directly with very limited clerical burden. The data bank can provide for integration of materials available through other agencies such as ERIC with materials developed through local programs.

Information and Storage System. The heart of the total system proposed here will be the development of an information and storage system through systems analysis, design, development and computer programing to provide the proper linkage of the various components discussed. Such an information system must contain the necessary capabilities to accomplish such tasks as planning, need determination, resource identification and availability, evaluation of technology and curriculum, personnel locator, educational model development and simulation, and rapid retrieval and dissemination of significant information on demand.

A computer based on an educational information system is necessary to support the context evaluation mechanism proposed here. The principle objective of the mechanism will be to evaluate and monitor the program of teacher training through comprehensive programs involving research, development, and implementation. Context evaluation is dynamic, remaining continually responsive to modification of programs.

Implementation of an educational information system responsive to the needs of context evaluation in teacher education should provide a vehicle which not only addresses the kinds of activities but which is sensitive to the more significant functions that the program must perform. Hence, to be effective the information system must be concerned with determining specific needs and problems, analyzing those needs in terms of educational services or research which can be applied against them; identifying resources (i.e., teachers, researchers, facilities, materials, etc.); providing information for developing programs to address needs; providing information for program implementation; generating updated need or research requirement profiles; and providing evaluation results.

Program Planning. The fourth and final component of the context evaluation system is that of planning. The components within this subsystem will be discussed in terms of the following activities: (1) information analysis and synthesis, (2) need and opportunity identification, (3) problem explication and reporting, and (4) planning and decision-making.

Information and Analysis. Once data regarding the program have been generated, the complex task of analyzing and interpreting this information requires a cooperative effort on the part of many individuals. The first step is that of developing a report prepared by the team of evaluators directly responsible for the context evaluation system. Data will be packaged in a report with interpretations made from data analysis, research and its relation to current data, and innovative program data and its relation to data on the present program. The objective of this first step is to provide a dynamic baseline on the part of the evaluation team that takes into consideration all the facilities available through the information storage and processing system.

Need and Opportunity Identification. With the evaluators' report involving the analysis and synthesis of data, the second step is that of need and opportunity identification. The evaluator combined with the curriculum experts within the teacher education program come together to identify possible needs within the program. Even though the program is meeting current objectives, the group must also consider future needs and be kept up-to-date on the innovative practices in teacher education across the country. Recommendations are made at this point as to possible changes or recycling of the program. If change is recommended it may come about because of failure to reach objectives, evidence that current objectives are not sufficient to meet the demands of society, evidence that innovative practices identified indicate serious consideration for change, or some other factors.

Problem Explication and Reporting. Depending on the recommendation developed in step two, a report is prepared to meet the need of the various audiences it is to serve. If changes are recommended the report must contain all the pertinent information necessary to make the decisions for change. A complete package involving data on present program, research, innovative practices, and recommendations must be prepared to meet the needs of the group participating in the change decision.

Planning and Decision-Making. With the report disseminated to those participants involved in the decision-making process (e.g., faculty, administration, etc.), decisions can be made for recycling or change. These decisions will be based on adequate data and information, the complexity of which will be determined by the nature and degree of the problem.

## Operationalizing the Proposed Evaluation System

Operationalizing and implementation of the evaluation system described in this section will require significant resources. It is proposed that The Ohio State University Evaluation Center assume responsibility for the evaluation of the proposed program in accordance with the system described above. It is futher proposed that approximately ten percent of the budget of the total program be allocated to evaluation. The wisdom of this should be evident in view of the large commitment of resources to the proposed teacher education program, the need for adequate information to support the program, and the need for a generalizable evaluation model in teacher education. Clearly, one spin-off benefit of an evaluation program, of the extent proposed herein, would be in the development and testing of a generalizable system for the evaluation of innovative programs in teacher education.

Certainly the development and testing of an evaluation system was not a primary goal of this project. However, the project director and staff became convinced at the very initiation of the project that a basic reason for the lack of reliable information about teacher education programs was the complete absence or obvious irrelevance of evaluative data and procedures. For this reason, the manner of evaluation became a primary concern if this new plan is to fare better then previous efforts. The obvious utility of the evaluation model designed and its applicability to other programs should make possible many important comparisons.

# Chapter VI

# SUMMARY OF THE REPORT

## The Task

A project staff representing a consortium of the State Universities of Ohio has prepared a set of educational specifications in accordance with a request from the Bureau of Research of the United States Office of Education for educational specifications for a comprehensive undergraduate and in-service teacher education program for elementary teachers. The decision to participate in this unique, cooperative endeavor was influenced by a concern that existing programs of teacher education are not adequate to prepare future teachers for the changing conditions in American schools. A succinct description of these changes has been provided by Dr. Don Davies, Associate Commissioner, Bureau of Educational Personnel Development, U.S. Office of Education. The changes identified by Dr. Davies include:

1. Moving from a mass approach to an individual approach in education.
2. Moving from an emphasis on memorizing to an emphasis on learning how to think, how to learn, and an emphasis on the non-cognitive, non-intellectual components of life.
3. Moving from a concept of a school isolated from the community to a concept of a school that is in and of the community.
4. Moving from a fear of technology to utilizing machinery and technology for educational purposes.
5. Moving from a negative to a positive attitude toward children who are different.
6. Moving from a provincial perspective of the world and education to a multi-cultural perspective.
7. Moving from a system characterized by academic snobbery to one which recognizes and nurtures a wide variety of talents and fields.
8. Moving from a system based on serving time to one which emphasizes performance.

Because of the all-encompassing impact of change in education, the consortium has chosen to prepare model preparation programs dealing with at least those groups of educational personnel actively involved in the education, induction, and support of new teachers--the major target populations for the changed program of teacher education. For the same reason, existing plans of teacher education were not considered as models or limitations. Traditions of teacher education were not maintained in order to insure the revised structure so necessary to hasten the demise of the self-contained classroom. The R & I (research and instruction) organizational pattern has been adopted as the preferred arrangement of personnel to implement the new programs. This is a team teaching concept developed by the Wisconsin Research and Development Center for Cognitive Learning.

## The Design

Figure 2[29] presents a graphic representation of the conceptual design of the project. A guide to the various personnel resources assembled is provided in Figure 3[30]. The statement of goals for the program of teacher education was adapted from the objective and comprehensive effort of the Committee on Quality Education of the Pennsylvania State Board of Education. A search for appropriate goals among formulations for existing programs had been a waste of time. The goals, as adapted, were submitted to a steering committee of outstanding authorities and to the members of the consortium for modification, addition, and, in a sense, legitimation. The statement of goals received enthusiastic support.

Because an initial and continuing concern of the project was to accommodate the forces of change, it was decided to begin to refine the general goals by considering them from the perspective of five *contexts*. These contexts--instructional organization, educational technology, contemporary learning-teaching process, societal factors, and research--represent the more important sources of change in teacher education today. An authority in each of these context fields prepared a position paper on his topic. Other knowledgeable persons in each context field were provided with these position papers and asked to react to them. These position papers and reactions were a rich source of data in the preparation of behavioral objectives.

The behavioral objectives were a result of the combined efforts of the project staff, consultants, and an independent consulting agency, EVCO Basic Instructional Research Design in Albuquerque, New Mexico. The consultants and staff provided the knowledge of the content, and EVCO provided the expertise in translating this knowledge into the form of behavioral objectives. It was a productive partnership generating over 2,000 behavioral objectives.

Because this was to be a comprehensive program, objectives were prepared for six target populations concerned with teacher education:

1. Pre-Service--Pre-School and Kindergarten Teachers
2. Pre-Service--Elementary Teachers (Grades 1-8)
3. In-Service Teachers
4. College and University Personnel
5. Administrative Personnel
6. Supportive Personnel

The process at EVCO was to secure a breakdown of each context into major subject areas which were further divided into topics. Behavioral objectives were then prepared for topics under each of the six target populations listed above.

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[29] *Supra*, p. 11.

[30] *Supra*, p. 12.

## The Product

Educational specifications were then formulated to implement the entire range of behavioral objectives. These consist of the behavioral objective(s) to be implemented, the treatment to be utilized in accomplishing the objective(s), materials needed, and the evaluation procedures to be applied to determine whether the objective(s) have been successfully achieved. Because of overlap, 818 specifications were able to accommodate the 2,123 objectives. Specifications were prepared by the project staff, personnel from the Wisconsin R & D center, MOREL (a regional laboratory), and consultants. These personnel received uniform instructions via A Manual for Specification Writers prepared by the project director.

The specifications are collected in a separate volume (Volume II) to facilitate handling and reading of the project report. They are organized according to a content breakdown under contexts, subject areas, and, finally, topics.

## Organization for Implementation

In order to deal with the 818 specifications it was necessary to process them in some way to permit selection, rejection, ordering and reordering according to the population to be served. This was accomplished by a coding process. Each of the four major parts of every specification has been coded by the project staff according to the scheme presented in Chapter IV of the report. There are, of course, many advantages to this procedure, but the most obvious is the rapid collection of all specifications pertaining to one target population. In order to demonstrate this capacity and to provide a guide for those wishing to implement aspects of the program, the specifications are grouped according to the six major target populations.

Table No. 17 indicates the number of specifications by context required by the composite programs for each target population. Of course, this is only a gross summary to suggest the dimensions of the programs. Actually, the user would be supplied with the numerals of each specification in the population and a detailed summary of all of the information coded. This, in itself, tells one much about the requirements of a program for the particular target population. There is, however, no one prescribed way of ordering the specifications. This could be a function of progressive difficulty of content, of ease of administration--that is all activities to be performed in the field or the classroom could be grouped together--of teaching method such as academic presentation followed by simulation, followed by actual application, or of other criteria relevant to the particular conditions of users of the specifications. The organization of specifications under the six target populations in Chapter IV of the report suggests various techniques of ordering the specifications.

## TABLE 17

## SUMMARY OF COMPOSITE SPECIFICATIONS FOR SIX TARGET POPULATIONS BY CONTEXT

| Target | Context | | | | | |
|---|---|---|---|---|---|---|
| | Instructional Organization | Educational Technology | Learning-Teaching Process | Societal Factors | Research | Total |
| Pre-School | 157 | 60 | 102 | 74 | 67 | 460 |
| Elementary | 151 | 75 | 102 | 69 | 67 | 464 |
| In-Service | 144 | 85 | 113 | 91 | 77 | 510 |
| College & University | 79 | 93 | 96 | 65 | 116 | 449 |
| Administrative | 62 | 70 | 103 | 126 | 77 | 438 |
| Supportive | 22 | 71 | - | 28 | - | 121 |

Additional Capabilities of the Process: Special Purpose Model Programs. It is highly essential that a completely new program of teacher education provides easy access to groups whose needs and interests are found in parts of the total program but who cannot participate in all aspects of one of the programs prescribed for the six target populations. To create programs for such special purposes it is necessary to agree upon the general goal and the specific objectives. These become the selection criteria to draw out appropriate specifications. When the cards were sorted for one example, special program--Research Training for Teachers Conducting Research in the Instructional Setting--ten topics were identified in three contexts using only 49 separate specifications. Such a program would likely be offered as an eight week summer institute. This exercise is found in Chapter IV. It is included as a prototype of the myriad of possible special purpose model programs.

Characteristics of Programs Utilizing The Educational Specifications. It is difficult to generalize about the various uses of the specifications discussed under the selected target populations and the one prototype special purpose program. However, there are a few dominant characteristics of any program based on these objectives and specifications. These are detailed in Chapter IV of the report. Among these easily identifiable characteristics are:

1. The major instructional focus will be on the contexts of Instructional Organization and Contemporary Learning-Teaching Process.

2. Both Educational Technology and Societal Factors will receive more attention than in traditional programs.

3. There will be an emphasis on conducting and using research in the instructional setting.

4. The treatments indicate a program which is activity centered.

5. Student involvement is equally divided between individual study and group or team experience.

6. Typical treatments provide for a progressive involvement from observation through simulated activity to direct classroom experience.

7. Conference, performance, and observation are important means of evaluation.

8. A wide variety of media is required to implement these programs.

## Evaluation

The process of evaluation selected for this project was of prime importance because it must not only guide the planning stage but serve again to direct the implementation stage of the project. Then, too, it was necessary to devise an evaluation model which would permit comparisons between the consortium program and other strategies of teacher education. The model prepared by Professors Stufflebeam and Hammond of Ohio State University has all of the requisite capabilities and more. The model is referred to by the acronym CIPP suggesting the comprehensiveness and versatility of the model in dealing with evaluation of Context, Input, Process, and Product. Figure 10[31], A conceptual schema of the total proposed evaluation system, presents a symbolic overview of the total evaluation program which provides for systematic context evaluation and *ad hoc* process and product evaluations. A significant portion of the project resources for the implementation phase of the program will be placed in the evaluation component.

In addition to the comprehensive effort referred to in our discussion of the CIPP model, it was necessary to utilize the PERT (Program Evaluation Review Technique) process as a type of internal check on meeting the various self imposed deadlines necessitated by the limitations on time. This technique was the principal monitor of progress during the planning stage.

There are many innovative features in the specifications for a new teacher education program. Among these none is so important as the evaluative process. For the first time in history a program has been arranged in behavioral terms so that it may not only be evaluated at a given point in time, but also so that it is self-correcting. Provisions for prompt and objective feedback are the most innovative elements and will enable all concerned to discuss the success or failure of a program to prepare educators in meaningful terms. This enables the implementing institutions to enter into the new program with confidence that if the selected specifications are not complete or not relevant, they will be supplemented or modified *in the regular course of the program.*

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[31] *Supra*, p. 225

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